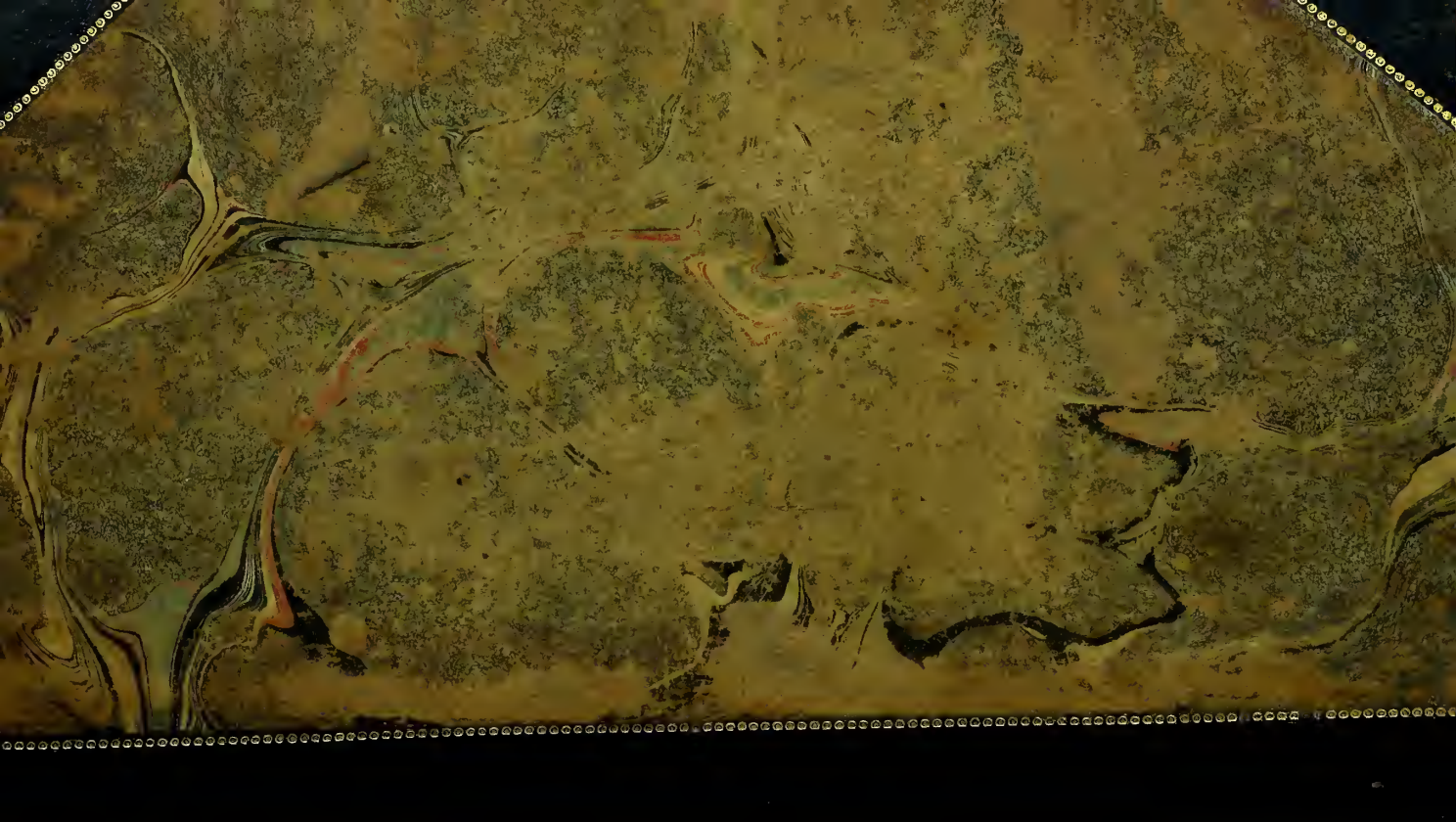

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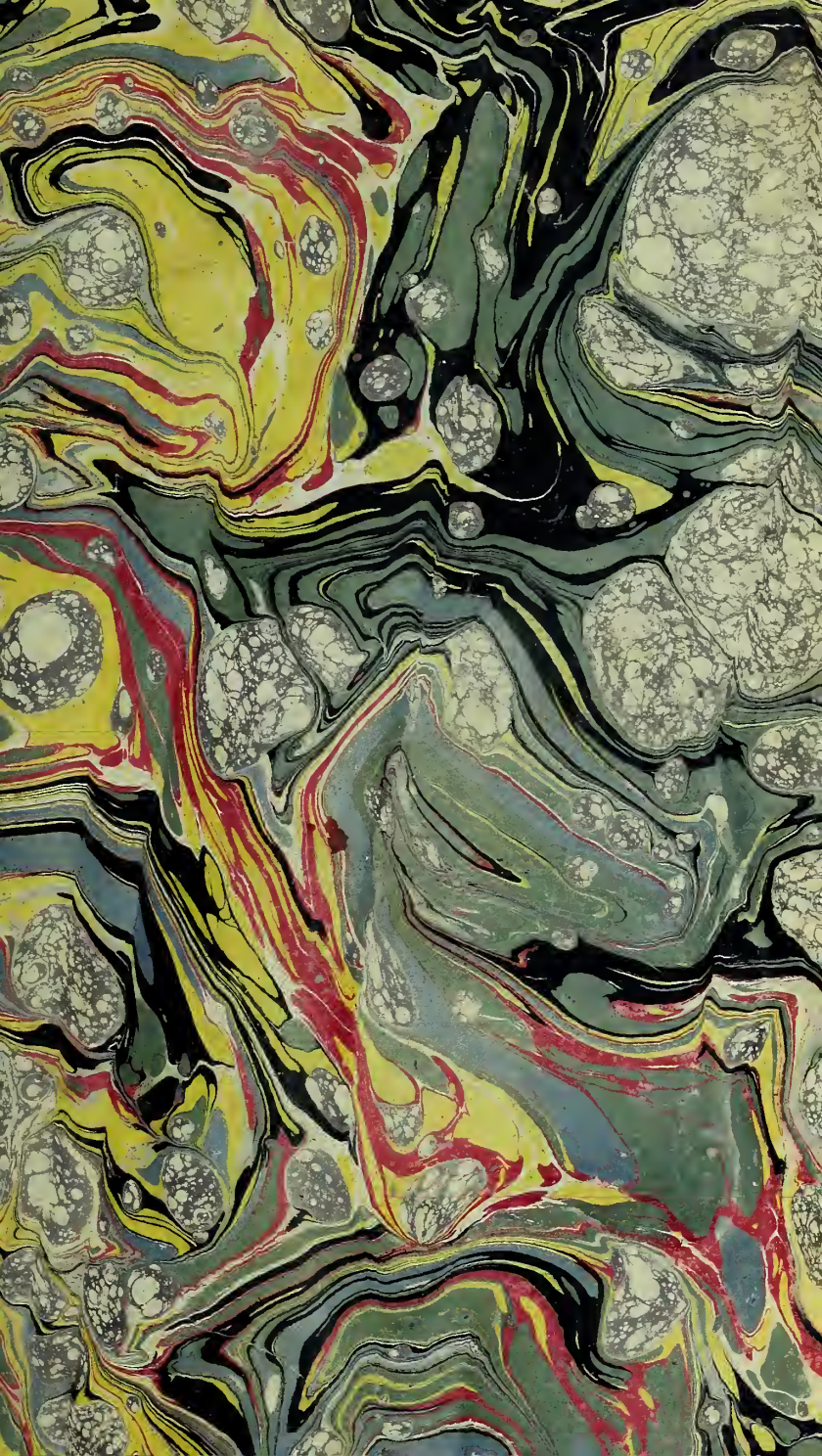

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MEDICAL SKETCHES.

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MEDICAL SKETCHES:

IN TWO PARTS.

By JOHN MOORE, M. D.

——UT SI
CÆCUS ITER MONSTRARE VELIT. HOR.

LONDON:
PRINTED FOR A. STRAHAN; AND T. CADELL,
IN THE STRAND.
MDCCLXXXVI.

Moore

TO

WILLIAM LOCK, Esq.

DEAR SIR,

THE First Part of this Work was begun at your seat of Norbury Park, where Nature and Art are so finely combined, and the charms of social intercourse and retirement so happily united. It was natural therefore to think of inscribing the work I was then planning, to the person whom so many circumstances, and all the surrounding objects, presented to the mind. And, as the *subjects* of these Sketches

are highly intereſting to humanity, thoſe who have the happineſs of your acquaintance will readily perceive the propriety of addreſſing them to you.

By this teſtimony of my regard, however, I am conſcious that I ſacrifice your diſlike of public attention to the indulgence of my own pride, in ſubſcribing myſelf, with the greateſt ſincerity,

DEAR SIR,

Your affectionate friend,

and humble ſervant,

Clifford Street,
April 15, 1786.

J. MOORE.

PREFACE.

THESE Sketches were originally undertaken on the following occaſion: *A near relation* of mine, who has the juſteſt claims to my affection and eſteem, had the health of a conſiderable detachment of the foot-guards entruſted to his care at a very early period of life. They were ordered to reinforce the army at that time in Virginia, under the command of Lord Cornwallis. Anxious to perform that duty with all the efficacy in his power, he requeſted me to give him in writing a few obſervations and general rules relative to the nature and treatment of the diſeaſes moſt likely to occur during the paſſage, and while the party remained ſeparate from the army.

I accord-

I accordingly drew up a haſty compendium or practical treatiſe on ſundry diſeaſes, beginning with fevers, adding ſuch directions as I imagined might enable him to decide in various exigencies with greater promptitude and accuracy. Since his return to England I have beſtowed ſome pains in improving ſeveral of thoſe rude draughts, particularly thoſe upon fevers, which from a few general ideas and detached practical hints have ſwelled to the ſize in which they now appear.

The obſervations with which I furniſhed him on ſome other diſeaſes are alſo conſiderably enlarged: Whether I ſhall ever hazard their publication, is a point on which I am as yet undetermined.

The Seven Sketches which form the Firſt Part of this Work were afterwards compoſed upon other occaſions. They are attempts to explain in familiar language certain pro-

ceſſes continually carried on in the animal œconomy, which are not only curious in themſelves but eſſential to life; and ſurely as intereſting to mankind as any other part of natural philoſophy. They may therefore be conſidered as no improper introduction to the Practical Eſſays which follow; but which, after all, I preſent to the Public with great diffidence, being conſcious that dogmatic confidence in our own opinions never ſtands upon more ſlippery ground, or is more expoſed to ridicule, than when thoſe opinions regard the art of medicine.

CONTENTS.

PART THE FIRST.

SKETCH		Page
I.	*On the practice of medicine*	1
II.	*Of digestion* -	66
III.	*The circulation of the blood*	95
IV.	*Of the secretion or separation of particular fluids from the blood*	109
V.	*Absorption* -	154
VI.	*Respiration* -	179
VII.	*The nervous system* -	199

PART THE SECOND.

SKETCH		Page
I.	*Of fevers in general*	265
II.	*Of inflammatory fevers*	334
III.	*The remittent or mixed fever*	367
IV.	*Nervous fever*	426

MEDI-

MEDICAL SKETCHES.

I.

ON THE PRACTICE OF MEDICINE.

IN the inveſtigation of medical, as in that of ſome other intereſting ſubjects, the mind is apt to remain in a diſagreeable ſtate of doubt and ſuſpenſe, which is often augmented inſtead of being removed by farther ſtudy and experience.

The oppoſite ſyſtems of medical writers, the difference in the practice of living phyſicians, and the different effects which ſeem to flow from the ſame practice, muſt

naturally produce doubt in a ſenſible and unprejudiced mind, and are ſtrong proofs that the art of medicine itſelf is uncertain and conjectural.

There are indeed phyſicians who imagine they fully underſtand the nature of every diſeaſe, who have high and enthuſiaſtic notions of the powers of medicine, and are never diſturbed with doubts or diffidence of their own peculiar ſagacity in the application of thoſe powers. Whatever may be the opinion of the multitude, men of real penetration, who underſtand character, imagine that thoſe of the above deſcription are commonly found among the weak, the oſtentatious and ſuperficial, and ſeldom or never among the acute and intelligent. Great confidence in the power, and belief in the effect of medicine, they think, are the offspring of ignorance and credulity; and that acute reflection and experience, while they inform

form us what art can really do in the cure of diſeaſes, alſo teach us what is the work of nature only;—the effect of which generally is, greatly to moderate our faith in the miraculous powers of the former.

It muſt be acknowledged, that few things can be more irkſome to a mind eager in the purſuit of truth, than a ſtate of conſtant ſcepticiſm. Irkſome as this ſtate is, however it does not lead to ſuch groſs abſurdity and ſuch dangerous error, as too great confidence in our own ſuperior lights, implicit faith in any particular ſyſtem, or an eager belief in facts, without repeated experience, and the moſt cautious examination.

In tracing the annals of medicine, we find that many doctrines now exploded, and proved to be erroneous, were once ſupported by men of the higheſt medical authority. One would imagine ſuch ex-

amples would cure the moſt preſumptuous of a dogmatical reliance on their own particular opinions; eſpecially as their miſtakes and errors affect the lives of others.

This is one benefit which the medical ſtudent may derive from making himſelf acquainted with the various ſyſtems which have prevailed in different ages and countries, although now they bear no authority. To ſtudy the revolutions of medicine, and know how long each opinion bore ſway, by what means it was depoſed, and what ſucceeded and reigned in its ſtead, is, on various accounts, expedient. However falſe ancient theories may be deemed, many of them are highly ingenious; by endeavouring to comprehend them the mind is habituated to inveſtigation, and ſtrengthened by exerciſe; we diſcover what led men of great ſagacity into error; ſuch diſcoveries ſerve as beacons to prevent us from ſteering the ſame courſe.——Amidſt the froth of falſe

falſe theory, many uſeful hints and obſervations may be found; for it often happened that the practice was good, even when the reaſoning was founded on falſe principles.

But although it is an ornamental, and in ſome degree an uſeful part of knowledge, to be acquainted with the various opinions that have prevailed in the medical world, it muſt be confeſſed that reaſonings *à priori*, and ſyſtems founded upon them, have ſeldom led to the cure of diſeaſes. For that eſſential part of the art of phyſic, we are indebted to the obſervations and facts regarding the ſymptoms and progreſs of diſeaſes, and the effects of remedies, that have been collected in the courſe of ages by men of diligence, acuteneſs, and integrity. Thoſe, when ſeparated from that chaos of indigeſted obſervations, pretended diſcoveries, and falſe facts, which are alſo on record, render the art of medicine, when

practiſed by men of ſenſe and integrity, a bleſſing, and not a curſe, to mankind.

It will be ſaid that the powers of thoſe medicines, which are found moſt effectual in the cure of diſeaſes, were not diſcovered by men of uncommon ſenſe and penetration, but ſome by mere accident, others by ignorant ſavages, and others we owe to the chymical enthuſiaſm of a credulous age, which, hot in the purſuit of the philoſophers ſtone, ſtumbled on diſcoveries in medicine and other arts, far more beneficial to mankind than the object they purſued, even had they obtained it; but that few diſcoveries of this nature were made by men of ſcience in conſequence of ſtudy and reflection.

There is no denying this aſſertion, and the reaſon is plain:—When the moſt profound ſagacity is exerted on ſubjects beyond its reach, it is on a level with the groſſeſt

groſſeſt ſtupidity: All the ſenſe and learning in the world cannot *à priori* find out the qualities of any ſimple or mineral whatever. If the roots of rhubarb and ipecacuanha were produced to an aſſembly of phyſicians or chemiſts, who had never ſeen or heard of them before, they never could, by any reaſoning, examination, or proceſs whatever, diſcover, that the one is poſſeſſed of a purgative, and the other of an emetic quality; or if they were told that each was endowed with one of thoſe qualities, all their ſkill would be baffled in attempting to aſcertain which was the emetic, and which the purgative.

There is but one way of diſcovering the qualities of thoſe or any other drug, which is by trying its effects on man or ſome other animal. But although the moſt ſtupid of mankind has the ſame power with the moſt ſagacious of making the experiment, the latter will, when it is

made, turn it to more uſeful purpoſes. His ſuperior talents will then come into play; by reflecting on the ſymptoms of diſeaſes, the means which nature ſometimes takes to relieve or terminate them, and the analogy between one diſeaſe and another, he will apply the powers diſcovered in the two plants more judiciouſly, and with a greater probability of ſucceſs to the cure of diſtempers.

The earlieſt practitioners in medicine, having no recorded facts or rules to direct them, formed the one, and collected the other, by a diligent attention to nature.—They obſerved an inſtinct in dogs and ſome other animals, that directed them to particular herbs, which ſeemed to relieve them in ſickneſs.

Melampus, a Greek, one of the earlieſt who attempted to cure diſeaſes, is ſaid to have diſcovered the cathartic quality of hellebore,

hellebore, by obſerving its effects on goats. By the uſe of this medicine, and of cold baths, we are told he cured the daughter of Pœtus king of Argos: And afterwards he is ſaid to have cured Iphiclus, one of the heroes who attended Jaſon on his argonautic expedition, of impotency, by giving him the ruſt of iron in wine. We are not particularly informed how he came to the knowledge of the cold bath, or of iron; but we may naturally imagine, that he might diſcover the ſtrengthening effect of the former, by what is produced on himſelf and others when uſed for pleaſure: the virtues of iron he muſt have found out in ſome ſuch accidental way as he did thoſe of hellebore.——A young woman, labouring under the chloroſis, or a man under a tabes of a peculiar kind, may have drank wine or ſome other liquor accidentally impregnated with iron, and received benefit from it; reflection and reaſoning from analogy might induce him to

make various trials, till he applied them at laſt in the ſucceſsful manner above mentioned.

In certain debilitating diſtempers incidental to both ſexes, what could a modern phyſician uſe, more efficacious than ſteel and the cold bath?

Thus from the earlieſt accounts we have of the practice of medicine, we find that experience and reaſoning went hand in hand. They cannot be ſeparated without the moſt fatal conſequences; for it is not more abſurd to imagine, that cures for diſeaſes are to be diſcovered by dint of reflection only, than to imagine that we can make a proper uſe of experience and obſervation without ſound reaſoning.

The ancients not only obſerved the effects of that inſtinct by which brutes are directed to certain plants for relief when they

they are unwell, and then applied them to the complaints of men, but they alſo attended with diligence to the manner in which nature, when left entirely to herſelf, relieved or threw off diſeaſes. They perceived that certain diſorders were carried off by ſpontaneous vomitings, others by looſeneſs, and others by augmented perſpiration; and having thus learned how diſeaſes were cured by nature, whenever her powers ſeemed too weak and tardy, then, and then only, they ventured to aſſiſt her by art.

Here it is worthy of obſervation, that although that ſenſation or inſtinct by which ſome animals are prompted to ſelect particular vegetables for the removal of diſorders, is not given in ſo ſtrong or particular a degree to man; yet nature often directs him alſo, though in a more general way, to the beſt method of relieving his complaints. In fevers, the patient generally has a deſire

ſire for cooling, light, aceſcent drinks, and diſlikes thoſe which are of a heavier and more heating nature: He covets juicy ripe fruits of various kinds, and nauſeates animal food;—a free ſtream of air, and a ſpacious cool bed-chamber, are equally ſalutary and agreeable to him; while confined air, and a ſmall heated room, are pernicious and oppreſſive. In thoſe inſtances, what the ſick perſon ſhews an averſion to, has a tendency to promote the diſeaſe, and what he reliſhes, has an effect in abating its violence. Other inſtances of the ſame kind might be enumerated; I will confine myſelf to one, which I have frequently had occaſion to obſerve.

Towards the end of very bad putrid fevers, when the patient, exhauſted by the violence and length of the diſeaſe, lay conſtantly on his back, had continual ſtartings in the tendons of the wriſts; his lips and teeth being covered with a black cruſt; his tongue

tongue trembling, and with difficulty held out; the pulſe weak and quick; in this deplorable condition, when the patient ſeemed inſenſible to every thing elſe, he rejected, with every mark of averſion that was in his power, medicines of every kind; but upon his lips and tongue being moiſtened with wine, he ſucked it in with avidity, although he could not open his teeth ſo as fully to admit a tea-ſpoon.

On perceiving this, as he would take no other cordial, nor any thing elſe, he was indulged in the wine, although the relations were often under great apprehenſions that it might have a pernicious effect, till they ſaw the ſtrongeſt evidence to the contrary.

In caſes ſuch as that above deſcribed, I have ſeen wine produce effects infinitely more beneficial than all the cordials and alexipharmics of the ſhops put together.—

That

That quantity of wine, which in perfect health might have occaſioned intoxication, in this weakened and exhauſted condition tended only to fill and ſtrengthen the pulſe, diminiſh the trembling and ſubſultus, diffuſe a genial warmth over the ſkin, and ſo far from increaſing, evidently abated the ſtupor and tendency to delirium, and ſaved the patient from the very jaws of death; yet the ſalutary effects of this powerful cordial in ſuch caſes are diſcovered by the deſire with which nature inſpires the patient for it in preference to every thing elſe.

A return of appetite is always a favourable ſign in a fever; and it has been remarked, that if the patient expreſſes a deſire for that aliment to which he ſhewed a particular averſion during the former courſe of his diſeaſe, it is ſtill more favourable; and if he continues to beg, with perſevering eagerneſs, for a little animal food, whether

fiſh

fiſh or fleſh, he may, with caution, be indulged; for the food he ſo earneſtly requires, though not preciſely what the phyſician would have recommended, ſeldom diſagrees with him.

When human reaſon is clouded by diſeaſe, it appears as if nature inſpired the ſick with a temporary uſe of the inſtinct of other animals: and thoſe phyſicians ſeem deſtitute of both reaſon and inſtinct, who on every occaſion refuſe to gratify them with what nature ſo ſtrongly indicates.

While we admit that experience and obſervation are the ſureſt guides in the practice of medicine, it muſt be granted at the ſame time, that to make judicious experiments and accurate obſervations, to draw juſt inferences from what we obſerve, not to confound the effects of one cauſe with thoſe of another, and to apply our experience and obſervations to the beſt

purpoſe, is not eaſy, nor ſo common a thing as is uſually believed.

We hear people every day, in talking of their phyſician, uſe language of this kind—"I own he is a very weak, ſilly man, but he has had a great deal of experience;"—or, "I grant you, he is an oſtentatious, parading coxcomb,—next to a fool indeed in other reſpects, but he is an excellent phyſician." They ſeem to think that common ſenſe diverts a man from the ſtudy of his profeſſion, like the French lady, who being told that her phyſician had not common ſenſe, replied, "Tant mieux, un homme qui paſſe ſon tems à étudier le ſens commun, comment peut-il apprendre la médicine? Monſieur l'Abbé —— qui parle Grèc comme Homère, ne ſait pas danſer."

There never was a greater abſurdity, however, than to ſuppoſe that a man of

an

an uncommonly weak underſtanding can be a good phyſician; he may indeed have a great deal of experience; he may poſſibly be even a man of learning, but without natural acuteneſs and good ſenſe there never was a good phyſician ſince the world began, the thing is literally impoſſible.

What is the buſineſs of a phyſician?—Why, to apply his knowledge and experience to the cure of diſeaſes, in which he muſt be directed by that degree of underſtanding he poſſeſſes; and if he is deficient in ſenſe, his experience will prove a ſource from which he will draw falſe inferences, and learning, if he has it, will make him more preſumptuous, and lead him farther into error.

How many practitioners do we meet with, who are convinced that fevers are cured by the draughts impregnated with contrayerva root and cardiac confection,

with which they teaſe the patient every two or three hours:—And how are they convinced of this? They will anſwer, from experience; for the drugs not having actually killed the patient, but only retarded his cure, he recovers at length, notwithſtanding all the draughts he has been obliged to ſwallow; the ſagacious doctor imputes the cure to his own preſcriptions, and perhaps publiſhes the caſe for the benefit of poſterity.

I have known a very well-meaning man miſtake a preſcription of feeble efficacy for one of the moſt powerful febrifuges that ever was contrived; he had ordered it probably at firſt when the diſeaſe began to take a favourable turn, or immediately before a happy criſis took place, and imputed the whole effect to the preſcription.

He gives the ſame medicine in another inſtance or two, on the very day the fever commences;

commences; it is an ephemera*, and he is confirmed in his opinion of the power of the medicine, he proclaims it the happieſt combination that ever was invented, which by a kind of elective attraction draws the morbific matter to itſelf, and then hurries it out of the body. After a few inſtances of this kind it is impoſſible to open his eyes; he imputes the unfortunate termination of other caſes to ſome latent cauſe which oppoſed the ſalutary effects of his favourite medicine. That any man, particularly a man of letters, and bred to the practice of phyſic, ſhould be ſo eaſily deceived, could ſcarcely be believed, if we did not ſee ſuch examples frequently, and if we did not know with what partiality mankind in general view what they conſider as their own inventions, and with what complacency they embrace opinions which flatter their own judgment.

* A fever that begins and ends in the compaſs of one day.

Another thing which prevents ſome practitioners from knowing the futility of their own preſcriptions, and what nature left to herſelf can do is, that they never leave nature to herſelf. The inſtant they are called, they fall to work with their draughts, juleps, and apozems, and perſevere with unrelenting aſſiduity till the diſeaſe terminates one way or other; if the patient recovers, the medicines get the credit; if he dies, the diſeaſe is thought to have been incurable.

The being teaſed to ſwallow drugs, is a ſpecies of diſtreſs to which the rich are more expoſed than the poor, provided the latter keep out of hoſpitals. *Nature* is allowed to cure as many of them as ſhe can, and *Art* being little ſolicitous of ſeducing ſuch patients out of her ſiſter's hands, they generally have *real* need of medicines before they are preſſed to take them. But a phyſician whoſe practice lies among the

higheſt ſpheres of life, if it amounts to three thouſand pounds yearly, is ſuppoſed, at a moderate computation, to receive two thouſand five hundred of that ſum for preſcribing for imaginary complaints, or ſuch as would have diſappeared fully as ſoon had they been left to themſelves. But this ought not to be imputed as a crime to the phyſician; if an old lady cannot dine with comfort till he has felt her pulſe, looked at her tongue, and told her whether her chicken ſhould be roaſted or boiled, it is reaſonable he ſhould be paid for his trouble.

The difference between a good phyſician and a bad one is certainly very great; but the difference between a good phyſician and no phyſician at all, in many caſes, is very little.

If during the courſe of the common epidemic diſeaſes which occur in this iſland every ſpring and autumn, two hundred

patients were taken promiſcuouſly, and one half delivered to the care of the faculty to be treated according to art; that is, as private patients by whom they are fee'd every time they preſcribe; and the other half delivered to the care of nurſes, inſtructed to give them no phyſic whatever, but merely cooling drinks, and ſuch light and ſimple food as the patients appetites might lead them to wiſh for, I am convinced the world would be a good deal ſurpriſed at the reſult of the experiment.

It is aſtoniſhing how exceedingly apt medical practitioners of every denomination are to impute to drugs that ſalutary effect which proceeds from the univerſal influence of another cauſe, which cauſe is that inherent bias obſervable in the animal œconomy to reſtore health; for as the ſurface of a lake which clearly reflects the ſky and hills and verdant ſcenes around its borders, when it is diſturbed by the falling of a ſtone, immediately endeavours to recover

recover its ſcattered images, and reſtore them to the ſame beauteous order in which they are wont to appear; in like manner when the natural courſe of the animal œconomy is interrupted and diſturbed by diſeaſe, the powers of the conſtitution are continually endeavouring to reſtore its organs to the perfect uſe of their functions, and to recover its uſual vigour and ſerenity.

This *vis medicatrix naturæ*, this conſtant tendency in nature to overcome diſeaſe and reſtore health, was obſerved by the father of medicine; and a ſentiment to the ſame purpoſe is the very firſt expreſſed by Sydenham in his ineſtimable work, and is acknowledged by all candid and diſcerning practitioners, to have a powerful influence in the cure of diſeaſes. Indeed I am inclined to believe that phyſicians, in proportion to their candour and diſcernment, acknowledge and rely upon this power in nature; and in proportion to their

ſelfiſhneſs and weakneſs, impute every recovery to their own preſcriptions.

A judicious and experienced phyſician conſiders himſelf merely as an aſſiſtant to nature; when her force ſeems to be ſufficient, he leaves her to perform the cure; when ſhe ſeems too feeble, he aſſiſts her by every means in his power. His patients, therefore, are ſure, in the firſt place, of all the aid which nature can give them; and as often as it is requiſite, if art has diſcovered or invented any thing to alleviate or remove their complaints, they are ſure of that alſo.

Whereas a phyſician who has an overweening conceit of his own powers and thoſe of his art, is apt by unneceſſary and officious attempts to interrupt the ſalutary proceſs of nature, and like the inconſiderate man who would plunge his hands into the diſturbed lake, in order to aſſiſt its efforts to

regain

regain its loſt tranquillity, he only helps to increaſe the diſorder and confuſion he means to remedy.

If well-meaning practitioners, who really wiſh to do every thing in their power for the recovery of their patients, and whoſe greateſt errors proceed from thinking more in their power than there is, can do ſo much harm; how much greater miſchief is to be dreaded from the number of cunning, unprincipled, intereſted practitioners in medicine, who, without being deceived themſelves, impoſe upon the weakneſs and credulity of others. Thoſe generally are men of ſuperficial knowledge, of a conſiderable degree of natural ſhrewdneſs, and ſuch a portion of impudence, as ſets them above embarraſſment, even when their ignorance and fraud are made manifeſt.

Such men ſtudy the foibles of mankind, fatten on the fears and hopes and caprices

prices of the rich valetudinarians, and ſqueeze the laſt lingering ſhilling out of the weakened hands of the poor.

There is a kind of quackery which ſome people ſeem to invite; they cannot be fully convinced of their phyſician's ſkill and attention without it. Proofs of this are to be met with every where: In a certain city on the continent I happened to call upon a lady, who, on account of a pain and ſlight ſwelling in her ancle, had conſulted a well-known phyſician, who, although he is accuſed by his brethren of much charlatanical parade in his practice, commands the admiration of his patients in a more ſupreme degree than any doctor I was ever acquainted with. He had juſt left her when I entered: She told me he had ordered a poultice of bread and milk to be applied to the part, and then giving her watch to her maid, ſhe deſired her to take particular care that the poultice ſhould be boiled exactly

four

four minutes and a half, for ſuch were the expreſs orders of Monſieur le Docteur. On my expreſſing ſome ſurpriſe at the minuteneſs of theſe orders, ſhe exclaimed, " Mon Dieu, quelle preciſion! il calcule comme un ange!"

The fortunes that have been made, and are ſtill making by men of this deſcription in the cities of London and Paris, and by the venders and inventors of noſtrums or ſecret and infallible cures, is quite aſtoniſhing. I mention Paris and London particularly, becauſe though other towns are in ſome degree expoſed to the ſame evil, yet the reputation of thoſe pretended cures is always higheſt where the field for impoſition is wideſt, and the chance of detection leaſt.

This I take to be the caſe in the largeſt and moſt populous cities, where phyſicians

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as well as noſtrums without merit have a far better chance of being eſteemed, than in ſmaller cities, where the real value of each muſt be known to a greater proportion of the inhabitants. Accordingly we find that hardly any of thoſe vaunted medicines of the capitals ſupport their reputation for any length of time in the provincial towns, becauſe the citizens are all in ſome degree acquainted with each other, and with the circumſtances of each caſe in which the medicine is uſed; its real effects therefore are more fully known. Whereas in ſuch a town as London, a fair and candid inveſtigation of the merits of a noſtrum is as difficult as it would be fruitleſs; for if the miſtakes and forgeries brought in its ſupport ſhould be detected and publiſhed to-day, freſh evidence of new miracles would appear in the papers to-morrow, and the minds of the multitude would be divided. When modeſt reaſon pleads on one ſide,

and

and aſſuming ignorance on the other, we may eaſily gueſs which will have the majority.

Beſides, it is to be remembered that no man has ſuch an intereſt in attacking, as the noſtrum-monger has in defending the character of his ſecret; accordingly moſt people, after they are convinced, either from their own experience or from that of others, of the futility of the medicine, give themſelves no farther trouble about it, but leave it to their neighbours to make the ſame inquiry or experiment if they pleaſe.

This is preciſely what the quack wiſhes, and if numbers *do* make the experiment, he gains his object; when his fortune is made, the reputation of his drug will give him no more concern. But in caſe by any accident its character ſhould be blaſted before he has accompliſhed his object, he then metamorphoſes his infallible pills into infallible drops,

gets

gets their praiſes founded, and their cures atteſted in the newſpapers, and very poſſibly the drops will finiſh what the pills began.

It will be ſaid that the atteſtations of cures are not always forgeries, for we ſometimes find people of character allow their names to appear in ſupport of the efficacy of quack medicines.

To this it may be anſwered, in the firſt place, that ſuch inſtances are very rare, in compariſon of the number of obſcure and ſuſpicious evidences which are brought in ſuch occaſions; and we muſt recollect beſides, that a good character, though it ſcreen a man from the ſuſpicion of being the accomplice, yet it cannot always ſave him from being the dupe of impoſition.

In diſeaſes which are liable to ſudden tranſitions from extreme pain to perfect eaſe, and where there are long intervals between

tween the paroxyſms, it is not very difficult to perſuade the patient, that he is entirely indebted to the noſtrum for that abatement of his complaint which takes place at the time he uſes it: Then gratitude to a ſuppoſed benefactor naturally prompts him to do every thing in his power to ſerve him; and ſometimes in the warmth of his zeal, eſpecially when diſputing with unbelievers, he is hurried into aſſertions concerning the effects of the medicine, which in cooler moments he would not have made.

The valetudinarian is often as fond of enumerating his complaints, as a ſoldier is of talking over his battles. And although he ſeldom finds a liſtener, who with a greedy ear devours his diſcourſe, yet like the latter he tries to create an intereſt; and to melt the heart by running through all his *diſaſtrous chances*, his *moving accidents* and *hair-breadth 'ſcapes**. It is his *hint*

* Othello.

alſo to ſpeak of ſome wonder-working noſtrum, for it is a thouſand to one but he has ſome favourite of this kind, which he ſtrongly recommends, and having once recommended, he becomes a party concerned in its cauſe, he reads with pathos and energy every advertiſement in its favour, he thinks his own truth and honour connected with the reputation of the medicine he praiſes, and imagines he gives the ſtrongeſt teſtimony of his affection to his friends when he teaſes them to ſwallow a little; it is in vain they aſſure him they are in perfect health, "This drug can be taken with "ſafety at all times; if the diſeaſe has ar-"rived before it is taken, it removes it; "if it is only on the road, it prevents its "arrival."

By ſuch means, many remedies which are ſecrets have been brought into vogue in the courſe of our remembrance; all of them attained a temporary reputation, which none

none of them could ſupport for any length of time; they were raiſed to notice by the breath of impoſture and the voice of credulity, they ſunk into darkneſs by the intrinſic tendency of their nature.

One medicine muſt be excepted from the neglect and contempt due to ſo many others.—Dr. James's fever powder has for a number of years enjoyed a conſiderable degree of reputation in this iſland, and in the colonies connected with it, although in the continent of Europe it is little uſed.

In an hoſpital where I had the chief care of the ſick for ſeveral years, I took frequent occaſion to compare the powers of this medicine with thoſe of antimony, James's powder being generally ſuppoſed to conſiſt of a preparation of antimony and teſtaceous earth, or ſome other inſipid powder, to diſguiſe it. The antimonial with which I

brought it moſt frequently into compariſon, was emetic tartar, with whoſe operation and effects thoſe of the powder ſeem to have a great reſemblance; whether they are exhibited in full doſes, ſo as to excite vomiting and purging; or in ſmaller doſes, when they produce only an increaſed perſpiration, a ſlight degree of nauſea; and if the ſmall doſes are repeated at proper intervals, ſome evacuation by ſtool.

On the firſt threatening of fever, a full doſe of James's powder operating at once as an emetic, ſudorific, and cathartic, ſeems ſometimes entirely to throw off the diſeaſe, and leaves the patient quite cool and free from fever; and in caſes where the fever is formed, and has continued ſome time before the powder is adminiſtered, it frequently diminiſhes the force of the fever; and uſed in ſmall doſes as an alterative, is of ſervice during the courſe of the fever.

All

All thoſe effects are alſo produced by proper doſes of tartar emetic, exhibited in the ſame manner. The principal difference ſeems to conſiſt in this, that a full doſe of tartar emetic operates, with more force and certainty, firſt as an emetic, and afterwards as a purgative, than a full doſe of the powder, but the latter with moſt certainty as a ſudorific; and it often appears to be as efficacious in removing or abating the feveriſh ſymptoms, although it operates with more mildneſs than the former.

When uſed as an alterative in ſmall doſes at conſiderable intervals, the fourth of a common doſe of the powder is leſs apt to create a naufea, or to excite vomiting, than a ſingle grain of tartar emetic diſſolved in a ſaline draught; in other reſpects their effects ſeem ſo ſimilar, that in fevers where I think antimony proper, whether at the beginning or during the progreſs, if the patient or his

relations have a predilection for James's powders, and ſeem ſolicitous that he ſhould have it, I very cheerfully comply with their wiſhes.

It will be ſaid, that if a full doſe of James's powder is given as above-mentioned, at the firſt threatening of a fever, although after its operation the patient ſhould be found perfectly cool and free from fever, that is no abſolute proof that the medicine removed or prevented one, becauſe, very poſſibly, no fever was about to form; for there is no certain criterion by which we can diſtinguiſh the firſt ſymptoms of a fever, which will laſt but one day, from thoſe of one which will prove tedious and dangerous; ſo that James's powder, when given at the firſt attack of ſuch diſorders, may get the credit of curing many complaints, which would have gone off as ſoon, and more eaſily, of themſelves.

This

This obſervation is certainly juſt, but it is no juſter when ſtated againſt James's powder, than againſt antimony, or any other medicine whatever.

Some phyſicians have ſuch an averſion to every compoſition the materials of which are kept ſecret, that they will on no account, and in no caſe, order them;—they imagine ſuch condeſcenſion beneath the dignity of the profeſſion. Their diſlike is, in general, well founded; but I cannot help thinking there may be particular caſes in which there is more wiſdom *in the breach than the obſervance* of this general rule; and as for the dignity of the profeſſion, its chief dignity certainly conſiſts in curing diſeaſes in the ſpeedieſt way poſſible.

In caſes where the uſual practice generally fails, or in which a medicine whoſe compoſition is kept ſecret has the reputa-

tion of acting with more efficacy than the known prescriptions; or even when the patient or his friends have a strong desire to try a particular medicine, which we know has been used in a thousand instances with safety, in any of those cases, obstinately to oppose the trial, merely because we do not know the precise ingredients of which it is composed, would, according to my judgment, be unreasonable. For let it be remembered, that although we have not a certain knowledge of the particular ingredients of the medicine in question, yet we have a knowledge of its manner of operating and its usual effect; this is the most material knowledge the physician can have. What more in reality does he know of Jesuits bark, rhubarb, or any other uncompounded medicine? The first is a medicine consisting of two or three ingredients, secretly mixed together by a physician of the name of James. The other two are medi-

cines

cines whoſe component parts are ſtill more ſecretly, and in a manner leſs underſtood, combined and mixed together by nature. If then he preſcribes the latter from a knowledge of their effects only, he ought not to reject all trial of the former, merely becauſe he is unacquainted with the particulars of its combination.

Nobody can approve leſs than I do of the practice of keeping any preſcription ſecret, which can be of public utility; but I cannot think that the inventors not acting in the moſt liberal manner poſſible, is a good reaſon for preventing a patient's reaping the benefit of the invention.

The enthuſiaſtic admirers of Dr. James's powder may conſider what I have ſaid above as but cold praiſe:—others, whoſe authority is far greater than mine, will probably imagine I have gone too far, in putting it upon a level, in particular caſes, with

any preparation of one of the moſt powerful medicines in the whole materia medica. Be that as it may, what I have ſaid proceeds from conviction founded on experience; however much therefore I am perſuaded of the worthleſſneſs of noſtrums in general, I thought it fair to diſtinguiſh this from others.

I know it is often ſaid by the advocates of other noſtrums ſtill in uſe, that they are condemned from intereſted motives only; that phyſicians, although fully ſenſible of their efficacy, decry them with unceaſing induſtry, leſt coming into univerſal uſe they ſhould annihilate half the diſeaſes of mankind, and ſpoil their trade.

Phyſicians, no doubt, have their ſhare of that uſeful jealouſy of trade which prevails in this country; yet I ſhould think it rather a violent ſuppoſition to imagine them capable

pable of carrying that ſpirit ſo far as to allow their fellow-creatures, their relations, and friends, to periſh in torment, rather than recommend what would give them ſpeedy and certain relief, merely becauſe the cure was not of their own manufacture.

But I will not inſiſt upon this argument, leſt I ſhould offend thoſe who are of a contrary opinion, and think a jealouſy of trade cannot be carried too far. Let us take the ſuppoſition therefore for granted, and admit that the whole faculty had entered into an agreement to ſtifle the reputation of a diſcovered cure for a diſeaſe for which no cure was known before,—the gout for example. The plot would prove ineffectual: The influence of the whole faculty combined, and each individual adhering to the ſpirit of the confederacy, could not prevent ſuch a medicine from coming into univerſal uſe, not in this iſland only, but, in ſpite of all

all their jealouſy of trade, even in Holland, and all other countries*.

An improvement in ſurgery indeed, however intereſting to humanity, might be kept down for a longer time, if we could ſuppoſe ſuch an improvement would be diſcouraged by the gentlemen of that profeſſion; for as important operations ſeldom occur, and when they do, are generally performed in hoſpitals, where the patient muſt ſubmit in all reſpects to the fancy of the operators, ſhould *they*, from obſtinacy, pride, or any other unbecoming motive, oppoſe the im-

* Sir George Baker has lately, in a very curious and inſtructive paper, ſhewed by what degrees the reputation of the Peruvian bark was eſtabliſhed in Europe, in ſpite of all the prejudices and paſſions it had to encounter, all of which it has overcome, although it was at firſt introduced by the caſual experience of an uncivilized people, ſupported by a body of men who are not phyſicians and never were popular, and its uſes more particularly developed by a perſon to whom the phyſicians of the time gave the name of quack.—Vide *Medical Tranſactions by the College of Phyſicians*, vol. iii.

provement,

provement, it would of courſe be greatly retarded in its progreſs.

But a thing ſo eaſily tried as a medicine, and which people in pain or in danger are ſo eager to make trial of, if it really poſſeſſed the virtues ſuppoſed, could not poſſibly be for any conſiderable time withheld from general uſe. Every day, every hour would add to its reputation; the beſt atteſted, *ſpontaneous* evidence of cures would come from all quarters; every grateful tongue would proclaim the virtues of the medicine; thoſe who talked of noſtrums and quackery, would be hiſſed into ſilence; and the voice of falſehood and envy would be drowned by the general ſuffrage.

The practice of inoculation of the ſmall-pox is certainly not for the intereſt of phyſic, conſidered as a trade. The preſent method was not introduced into this country by regular phyſicians, who are now ſeldom called

called to attend patients under inoculation, and who certainly have more reaſon to think this practice hurts their trade than any noſtrum does; yet no ſooner were its great advantages known, than it began gradually to be adopted, and in a very ſhort time became univerſal. I do not ſuppoſe that the phyſicians ever oppoſed it; but if anybody chooſes to aſſert they did, ſtill it muſt be granted that their oppoſition did not avail, which is all I am contending for.

Nothing can be more certain therefore, than that all uſeful diſcoveries whoſe pretenſions can be brought to trial, will, in time, make their way in every nation, unleſs indeed they are accuſed of ſtriking at the religion or government of the country. In England they would make their way notwithſtanding, or perhaps the ſooner, by their ſtriking at both.

It muſt be acknowledged, that by the arts of fraud, impoſture, and indefatigable puffing,

ſing, very worthleſs drugs are ſometimes raiſed to a reputation they do not deſerve, in ſhorter time than is required to bring an uſeful diſcovery to the fame it highly merits; but then time is ſure to ſupport, confirm, and eſtabliſh the latter, and gradually to ſhake, weaken, and at length totally to overturn the former. A ſtronger proof therefore needs not be given, that the vaunted noſtrums of former times were undeſerving of the character they enjoyed, than their having gradually fallen from eminence to neglect; whereas the virtues of Jeſuits bark, mercury, and other valuable medicines, have become more and more manifeſt; and we ſee them daily extended to the relief of other complaints than thoſe which at firſt gave them reputation. The proweſs of ſuch Herculean medicines as the two juſt mentioned, are ſufficient to exterminate all doubt, and eſtabliſh an univerſal reliance on their virtue in many

deſperate caſes;—but without hinting at ſecret noſtrums or drugs, artfully cried up for ſelfiſh purpoſes, there are medicines univerſally known and in daily uſe, about whoſe efficacy practitioners of the beſt intentions are of very different opinions, and yet both thoſe who think favourably of theſe medicines, and thoſe who deſpiſe them as uſeleſs, declare that they found their opinions upon *experience*.

The explanation of this ænigma is, that the medicines in queſtion, though their powers may on ſome occaſions be conſiderable, yet on others act very feebly, and in all caſes ſlowly; by which means their virtues appear different, and ſometimes are not diſcerned at all, but are entirely denied by people who have different powers of diſcernment, and who view them in different lights.

It requires more natural penetration and attention than many people poſſeſs, or are willing to beſtow, to determine the genuine effect of particular regimens or courſes of medicine. Beſides natural acuteneſs and ſagacity, it requires the exact weighing of every concomitant and collateral circumſtance which can promote, retard, or prevent the effect of the medicine at the time it is adminiſtered. It is proper to make repeated trials, and on people of various conſtitutions. It is abſolutely requiſite to have no favourite hypotheſis, to be diveſted of all partiality for or prejudice againſt the medicine, and in ſhort to have no view but the diſcovery of truth. But when ſuch inveſtigations are begun by people already biaſſed to one ſide or the other, or when carried on careleſsly, we need not be ſurpriſed to find that the inferences are different, though all are ſaid to be equally drawn from *obſervation*.

But as haſty and ſuperficial obſervation often contributes to raiſe the reputation of very fooliſh preſcriptions, ſo it ſometimes tends to injure thoſe of real utility. For the ſame ſtrergth of underſtanding which imputes ſaluary effects to the former becauſe they do not always kill, will impute pernicious ones to the latter becauſe they do not always cure.

One declares the bark never agrees with him;—another will ſuffer the moſt racking pain, ratherthan ſwallow any medicine, till he is aſſured there is no laudanum in it;—and a third will in no caſe take mercury in any ſhape or form.

All thoſe people aſſert, and are themſelves convinced, that thoſe prejudices are wiſe concluſions, founded on the *experience* they have had of their own conſtitutions;—very poſſibly thoſe medicines have been given them

them on ſome improper occaſion; or when their complaint was augmenting, and could not be ſtopped as ſoon as they expected: but nothing can be more raſh than to determine, becauſe a medicine does not prove immediately ſucceſsful, or becauſe it has been ordered injudiciouſly, that it is improper in every future ſituation that can happen.

It will be ſaid there ought to be great allowance made for the peculiarities of conſtitutions;—that there are antipathies not founded upon reaſon, but which ſeem inherent in the conſtitution, which, on certain occaſions, muſt have great weight with the phyſician.

Every thing of this nature ought doubtleſs to be duly weighed; but I am greatly miſtaken if there is any human body ſo framed as to render it improper in every poſſible caſe to give bark, or opium, or

mercury. It frequently happens that the medicine reprobated by the prejudice of patients, is the only one which can give them effectual relief: Yielding to ſuch prejudices therefore, is a more dangerous thing than many people are aware of, and the patient ought to be reaſoned out of them without loſs of time, unleſs reaſon ſhould unfortunately happen to be a thing which agrees with his conſtitution ſtill leſs than any of thoſe ſalutary medicines to which he ſhews ſuch an averſion.

While we admit therefore, that accurate obſervations are our ſureſt guides, we muſt keep in mind that careleſs and partial ones are as apt to lead to error as hypothetical reaſoning itſelf.

Examples are numberleſs; I will mention one where the error is as univerſal, and has continued as long as moſt: I mean the notion that the figures of animals of various kinds,

kinds, and other extraordinary marks, are often ſtamped on the faces or bodies of the fœtus in the womb, by the mere force of the mother's imagination.

On queſtioning the people thus marked, you are generally told, "that their mothers "while pregnant with them, were ſtartled "by the unexpected ſight of a mouſe, a "rat, a ſquirrel; or that a cherry, a plum, "a bunch of grapes, or ſomething, in "ſhort, which reſembles the mark, had "been thrown at them: That this acci- "dent had given much uneaſineſs to their "mother; and as ſoon as they themſelves "were born, the ſimilitude of what had "frightened her, whether animal, vege- "table, or whatever it had been, was found, "as you ſee, on their body."

Some years ago, I took a good deal of pains to inveſtigate this matter: I converſed

with a great number of women who either had ſuch marks on their bodies, or on thoſe of their children. They were all in the ſame ſtory; the marks on their own bodies, they aſſured me, proceeded from ſomething that had been thrown at their mothers; thoſe on their children's bodies, from ſomething that had been thrown at themſelves, during the courſe of their pregnancy. But on cloſe inquiry, and examining the relations and attendants, it appeared that the mother never had mentioned any thing of her having had a fright, or of her having an impreſſion that her child would be marked, until ſhe ſaw the mark; then indeed, and not before, ſhe told them of ſome adventure which was the ſuppoſed cauſe of it.

This turned out to be the caſe in every inſtance I heard of, which could be fairly and accurately examined into.

When

When I heard of any woman who was actually pregnant, and had met with ſome accident that gave her a ſtrong impreſſion that the child would certainly have a peculiar mark, I watched the event; and the child, when born, was free from every appearance of what had made ſuch impreſſion on the mind of the mother.

In ſhort, it always happened, either that the woman ſaw the mark firſt, and recollected afterwards what had occaſioned it; or if ſhe really met with ſome accident or fright during her pregnancy, and ventured to foretel that her child would be marked, ſhe was delivered of her fears and her child together, for no mark was ever to be ſeen.

The caſe of one lady is ſo ſtrongly in point, and was attended with ſuch ſingular circumſtances, that it is worth mentioning.

This lady, who had great averſion to monkies, happened unfortunately, during the courſe of her pregnancy, to viſit in a family where one of thoſe animals was the chief favourite; on being ſhewed into a room, ſhe ſeated herſelf on a chair, which ſtood before a table, upon which this favourite was already placed;—he, not naturally of a reſerved diſpoſition, and rendered more petulant and wanton by long indulgence, ſuddenly jumped on the lady's ſhoulders:—She ſcreamed, and was terrified, but on perceiving who had treated her with ſuch indecent familiarity, ſhe actually fainted; and through the remaining courſe of her pregnancy, ſhe had the moſt painful conviction that her child would be deformed by ſome ſhocking feature, or perhaps the whole countenance of this odious monkey.

The pangs of labour did not overcome this impreſſion, for in the midſt of her pains

pains ſhe often lamented the fate of her unfortunate child, who was doomed through life to carry about a human ſoul in the body of an ape. When the child was born, ſhe called to the midwife with a lamentable voice for a ſight of her unfortunate offspring, and was equally pleaſed and ſurpriſed when ſhe received a fine boy into her arms. After having enjoyed for a few minutes all the rapture of this change to eaſe and happineſs from pain and miſery, her pains returned, and the midwife informed her that there was ſtill another child.—Another, exclaimed ſhe, then it is as I have dreaded, and this *muſt* be the monkey after all. She was however once more happily undeceived; the ſecond was as fine a boy as the firſt: I knew them both;—they grew to be ſtout comely youths, without a trace of the monkey in either their faces or diſpoſition.

Numberleſs other examples might be brought to prove the neceſſity of examining and ſifting to the bottom, as often as ſuch inveſtigation is in our power, opinions, however long eſtabliſhed, and however generally received; for many are ſaid to be confirmed by univerſal experience, yet upon minute and accurate inquiry, this univerſal experience turns out to be no more than univerſal rumour, founded at firſt on careleſs obſervation, and afterwards ſwelled by falſe and exaggerated facts. But before we adopt any opinion which is to have an immediate influence upon the practice of medicine, we ought not only to weigh and examine thoſe facts which we receive from others, but we muſt alſo be exceedingly careful not to be led into error by thoſe which we gather from our own obſervation. It is evident that the firſt may lead us into error, becauſe they may be falſe; and unfortunately

unfortunately the ſecond, without attention and ſagacity, may alſo lead us into error, although they muſt be true.

A young practitioner orders a courſe of medicines in a particular diſeaſe,—a rheumatic complaint we ſhall ſuppoſe; after this courſe has been continued for ſome time, the patient recovers: Well, here is a true fact, from which, if he concludes that the medicines have removed the complaint, he may be in an error.

He orders the ſame courſe again for the ſame complaint; the patient grows worſe. Here is another true fact, ſtanding directly in oppoſition to the former: Well, what does the Doctor conclude now? After thoſe two caſes, if he balances the one by the other, he might infer that the courſe of medicines had juſt an equal chance of doing harm or good. But a phyſician will not naturally

naturally reaſon in that manner; having a partiality for the courſe he has preſcribed, he will moſt probably remain perſuaded, that in the firſt inſtance the medicines performed the cure; and in the ſecond, ſome peculiarity of conſtitution counteracted their effect, and made the patient worſe.

And here he may be wrong again; the medicines very poſſibly may have done neither good nor harm in either caſe, and the different events may have entirely depended on certain circumſtances, which the practitioner unfortunately overlooked.—— Perhaps a change of wind from eaſt to weſt in the firſt caſe, and from weſt to eaſt in the ſecond; or perhaps one patient's chamber was dry, and the other's was damp.

It cannot therefore be too often repeated, that every circumſtance muſt be weighed and attended to with the moſt careful circumſpection

cumſpection during the courſe of our experience, leſt this very experience confirm us in error.

This ſhews how very prepoſterous it is to put reaſoning in oppoſition to experience in the practice of phyſic, ſome degree of theory or reaſoning being abſolutely neceſſary to direct our experiments, and afterwards as neceſſary to enable us to draw juſt concluſions from them, and to apply them uſefully; not only in caſes in all reſpects ſimilar, but alſo in thoſe which, differing in ſome particulars, ſtill have a general analogy.

He who derives his medical knowledge from books alone, and whoſe exalted notions have not been moderated by experience, will practiſe medicine as the philoſopher who declaimed on the art of war to Hannibal, would have commanded an army; he who has ſeen much practice without

without reaſoning, as one of Hannibal's pioneers; and he, who to extenſive experience joins the greateſt natural acuteneſs and all the powers of reaſoning, as Hannibal himſelf.

Yet ſome practitioners have been ſo much ſhocked and diſguſted with the flimſy and fantaſtical theories which have been invented as a foundation for rational practice, that they explode almoſt every kind of reaſoning in the practice of medicine.—— "We truſt," ſay they, "to experience, and "experience only: We know that Jeſuits "bark ſtops the fits of an ague; and that "mercury cures the venereal diſeaſe: We "therefore order thoſe medicines in theſe "diſeaſes, without any farther reaſoning "on the ſubject."

No farther reaſoning would be neceſſary, if every diſeaſe made itſelf known by as certain ſymptoms as the two juſt mentioned;

ed; and if we had ſpecifics as efficacious as the bark and mercury for each. This would unqueſtionably be exceedingly fortunate for mankind in general; and if thoſe ingenious doctors who condemn all theory or reaſoning in the practice of medicine, are aware of the effect it would produce, nothing can be a greater proof of their diſintereſtedneſs; for it would at once annihilate *their* trade. Every man, as ſoon as he was taken ill, would know the diſeaſe and the remedy; he would ſend to the chemiſt's ſhop, inſtead of ſending to the doctor; phyſicians would be mere drugs, and the only drugs that would be quite uſeleſs, and the world would not only get rid of diſeaſes, but of what, in the opinion of ſome people, is very near as great a grievance.

But unfortunately diſeaſes are very numerous, and ſpecifics very few; perhaps the whole catalogue of thoſe which act with

any degree of certainty, is exhauſted in the two above mentioned; whereas the powers of other medicines are far inferior and much leſs certain, and the propriety of adminiſtering them often extremely doubtful; for although ſome diſeaſes manifeſt themſelves ſo plainly that the moſt ignorant cannot miſtake them, yet others appear in ſuch a queſtionable ſhape, that the moſt knowing are puzzled to decide to what claſs they belong, and the combined powers of experience and ſagacity have ſufficient employment in treating them.

A young man happened to be preſent at the trial of ſome cauſes of no kind of intricacy, where the proof was full, and where law as well as equity lay clearly on one ſide. The judge of courſe decided without heſitation, as any man of common ſenſe and honeſty would have done. "Of all "profeſſions," ſaid the young man to the judge,

judge, " certainly yours is the eaſieſt; " any body who has eyes may be a judge; " all that is neceſſary is to diſtinguiſh black " from white." " But that is a very dif- " ficult matter," replied the judge, " when " the cauſe is grey."

In medicine as well as in law, there are many caſes of a grey complexion, in which it requires all the experience of the cleareſt-ſighted to determine whether the black or the white predominates. Till this important point is juſtly decided, neither reaſoning nor experience can aſſiſt us in treating the diſeaſe: Although repeated experience in rheumatic and ſcorbutic caſes, for example, ſhould have convinced a practitioner of the efficacy of a particular treatment, if he happens to miſtake the pains and blotches which originate from a venereal ſource for rheumatic or ſcorbutic, his treatment will not avail.

But to reſume the compariſon; what renders the ſituation of the phyſician more diſtreſſing than that of a judge is, that it is only in doubtful caſes that the latter is at a loſs; for when the caſe is quite clear, he has a relief for the white, and a proper remedy for the black in his power: Whereas even in ſome of thoſe caſes which admit of no manner of doubt, and where the diſeaſe is perfectly aſcertained, the phyſician knows of no cure. I do not ſay he knows of no preſcription; thoſe he will find in ſome of the practical books in as great abundance for incurable as for curable diſeaſes.

I remember having been ſhewn a manuſcript copy of a New Practice of Phyſic, wherein the firſt article that catched my eye was that on the ſcrophulous diſtemper, towards the end of which I perceived the word CURE in capital letters, followed by a number of recipes, which I immediately

diately perused with the greatest eagerness, and then asked the author if he had known many instances of cures performed by those prescriptions. "I never knew one in my "life," replied he; "but of what service "would it be to describe a disease, if "after the description I did not add the "cure?"

I do not intend to imitate this gentleman on the present occasion, being determined to recommend nothing but what I know to be useful, and where I know nothing of that nature, fairly to own it; and although candour will oblige us often to make this humiliating avowal, perhaps it will appear surprising that we are not forced to make it oftener, when we consider the nature of the human frame, and compare what we know with what we do not know, of some of the principal animal functions.

II.

OF DIGESTION.

PREVIOUSLY therefore to any hiſtory of particular diſeaſes, or any practical obſervations reſpecting their cure, I ſhall, in the cleareſt manner I can, conſiſtent with the brevity of my plan, deſcribe the different proceſſes of nature in ſupport of ſome parts of the animal œconomy moſt eſſential to life; for as health depends upon their being performed with freedom and eaſe, whatever impedes or diſturbs thoſe vital functions, becomes the cauſe of diſeaſe.

One of the moſt important operations of nature, for the maintenance of animal life, is the digeſtion of food; from ſome impediment or diſturbance of this proceſs, a very

very great number of diſeaſes and complaints of various kinds certainly originate. It may therefore not be improper to conſider it in the firſt place.

Organs of digeſtion of ſome kind or other are common to all animals with whom we are yet acquainted; but beſides theſe, there are in the ſtructure of moſt animals, particularly in the human, two ſyſtems of mechaniſm equally eſſential to life, and mutually aſſiſtant to each other, yet diſtinct in their functions, and different in the principles upon which they act.

Theſe two ſyſtems are called the *vaſcular* and the *nervous*. By means of the firſt, which is the moſt comprehenſive, four very important functions are performed. I ſhall mention them in the order in which they are afterwards to be conſidered:

1. The circulation of the blood.
2. The ſecretion or ſeparation of certain fluids from the blood.
3. The abſorption by the lacteals and lymphatics.
4. Reſpiration by the air veſſels of the lungs.

The ſecond ſyſtem of mechaniſm above alluded to, is the nervous; it is entirely compoſed of the brain and the nerves.—This ſyſtem, though apparently leſs complex, is in reality more difficult to be underſtood than the vaſcular. We can examine the ſtructure of the brain and nerves, it is true, and have the ſtrongeſt proofs that they are the immediate organs of perception, ſenſation, and motion; but in what manner thoſe offices are performed we have not the leaſt conception.

The order in which we propoſe to make this abridged view of thoſe animal functions

may

may be thought improper: It may be imagined that it would be more natural to begin with the circulation, and the ſecreted fluids which aſſiſt digeſtion, becauſe there can be no digeſtion till the blood circulates. But as the animal œconomy conſiſts of a circular chain of links, in which it is difficult to diſtinguiſh the firſt, a ſimilar objection might be made at whatever link we began. Were we to begin with the circulation, it might with equal juſtice be ſaid, it would have been better to have given ſome idea of digeſtion, ſecretion, and abſorption, in the firſt place; becauſe the blood is formed and ſupplied with juices from the aliment, and no fluids can be ſecreted from it, till by the proceſs of digeſtion it has been enriched with thoſe fluids.

Upon the whole, therefore, it may be as well to conſider digeſtion in the firſt place, and then proceed to the other functions in the order above propoſed: If I fail in per-

ſpicuity, obſerving this arrangement, I ſhould equally fail in any other.

Preparatory for digeſtion, the ſolid food received into the mouth is divided into ſmall parts by the teeth, and blended with the ſaliva, a liquor ſeparated from the arterial blood to aſſiſt digeſtion. The ſaliva is neceſſary in ſome degree at all times, for the purpoſe of moiſtening the mouth and throat, but in far greater quantity at meals, when it is required to be mixed with our aliment; on this account nature has taken care that the taſte, ſmell, and even the ſight of victuals inſtantly excite a proper ſecretion of ſaliva.

The food thus divided, and by the mixture of ſaliva, air, and the mucus of the mouth and throat, blended into a pulp, is ſwallowed, and deſcends into the ſtomach, where it mingles with a fluid of a more active nature than any of the former called the gaſtric juice.

Very

Very different opinions have prevailed in all ages, reſpecting the manner in which digeſtion is performed in the human ſtomach. Celſus informs us this was a matter of controverſy among the earlieſt phyſicians, ſome aſſerting it was by *attrition*,—others by *putrefaction*; others thought that heat was the principal agent in digeſtion, by which the food was firſt, what they called, concocted, and then digeſted. A fourth claſs, deſpiſing the opinions of the former three, declared that no ſuch things as attrition, putrefaction, or concoction took place in the ſtomach; but the food, undergoing no other change than by chewing, was diſtributed all over the body*.

Similar controverſies upon the ſame ſubject have ſubſiſted among the moderns; many have imagined that a kind of fermentation takes place in the ſtomach for the

* Vide Celsus, lib. i.

purpoſe of digeſtion. About the end of the laſt century, or beginning of the preſent, the ancient doctrine of attrition was revived, and acquired new force from the character and calculations of the celebrated Pitcairn; he computed the muſcular force of the ſtomach alone, to be equal to a weight of above 100,000 pounds; and when the force of the diaphragm and abdominal muſcles is included, to a preſſure of about 250,000 pounds weight.

But none of the powers ſuppoſed by phyſicians, ancient or modern, to be the agents of digeſtion, were conſidered by Boerhaave as ſufficient for the purpoſe if taken ſingly; he thought the energy of the whole indiſpenſably neceſſary, and that digeſtion was effected by their united powers, in the following manner:

The food divided, blended, and ſwallowed, as has been deſcribed, mixes in the ſtomach

mach with the gaſtric fluid and the liquors we drink, is there macerated and in ſome degree diſſolved; the ſolution is farther promoted by the natural heat and cloſeneſs of the place, by the action of the muſcular coat of the ſtomach, by the compreſſion of the diaphragm and abdominal muſcles, by the pulſation of the aorta and adjacent arteries, by the air received with the food expanding and burſting the cells in which it is included. The ſolution is ſtill farther aſſiſted by the remains of food in the ſtomach, ſuppoſed to act as a ferment upon the heterogeneous maſs of freſh aliment; and the whole is completed by ſome degree of putrefaction, which he imagines takes place in the animal part of the food.—This account of digeſtion, with little variation, is adopted by Haller, and has prevailed pretty generally in the medical ſchools of Europe.

The

The notion that digeſtion in the human ſtomach is performed by a kind of trituration, certainly aroſe from what is obſerved to take place in the gizzards of granivorous fowls. Indeed, if the analogy were exact, there would be no need of heat, fermentation, putrefaction, or any other aſſiſtant.

The experiments lately made by the Abbé Spallanzani, Profeſſor of Natural Hiſtory at Pavia, prove that the ſtomachs of thoſe animals require no ſuch auxiliaries; and are able of themſelves to accompliſh feats, hitherto conſidered as ſuperior to the power, and even inconſiſtent with the nature of any ſtomach whatever. He found that the ſtomachs of pigeons, turkies, and other fowls, can pulverize pieces of glaſs; abrade and ſmooth the rugged edges of the hardeſt ſubſtances, even of granite, and for the moſt part without any injury

to

to the animal. He mentions two experiments in particular, which a perſon of leſs ardour for this kind of inveſtigation, and more tenderneſs for the animal creation, would not have made. He cauſed a leaden ball to be formed with needles fixed in its ſides, the points outwards, and forced it down the throat of a turkey. He contrived to make another ſwallow a ball of a ſtill more formidable conſtruction; for it was armed with little lancets, ſharp at the points and edges, inſtead of needles: Both balls were covered with paper, to prevent the throat of the animal from being hurt as they deſcended, but fixed ſo looſely as to fall off in the ſtomach. The conſequence was very different from what might naturally have been expected; the needles and lancets were broken to pieces, and voided without wounding the animal.

As there is always a conſiderable quantity of little ſtones found in the ſtomachs of grani-

granivorous animals, moſtnaturaliſts are of opinion that the birds are inſtinctively prompted to ſwallow them to aſſiſt digeſtion. The Abbé Spallanzani's experiments however tend to prove, and he himſelf is convinced, that in thoſe animals digeſtion can be entirely performed by the ſtrength and action of their muſcular ſtomachs, without requiring the aſſiſtance of thoſe little ſtones, which he thinks the birds pick up from miſtake and ſtupidity, not inſtinct.

But whatever is the power of digeſtion in thoſe animals, there is little analogy between their muſcular ſtomachs and thoſe of men, than which nothing can be leſs calculated for breaking or grinding hard ſubſtances. Had the human ſtomach ſeemed better formed for ſuch purpoſes; and had its triturating powers been calculated at even an higher rate by mathematicians, ſtill it would have been evident that it perform-

ed

ed no ſuch functions; for currants and even ripe grapes, which burſt on a ſlight preſſure, when ſwallowed entire, are often voided unbroken. This obſervation, made by men of no vaſt extent of genius or algebraical knowledge, and which in itſelf is not of the moſt refined nature, at once overturns the theory of trituration, with all the calculations which ſupported it, and ſhews to what a height of error, men of the greateſt learning and acuteneſs may build, when they *found* upon a falſe hypotheſis.

Were it poſſible after this to harbour any doubts on the ſubject, they would be diſpelled by the experiments made at Edinburgh by Dr. Stevens, and publiſhed in that gentleman's inaugural diſcourſe, and by other experiments made by the Abbé Spallanzani.——The purport of thoſe experiments was to aſcertain whether the gaſtric

liquor acts as a menſtruum for diſſolving the food, and is the chief agent of digeſtion. Dr. Stevens prevailed on a perſon who had the faculty, and had been in the habit of ſwallowing pebbles, and bringing them up at will, to ſwallow little hollow ſpheres of ſilver, filled with food of different kinds; the ſides of thoſe ſpheres being perforated in various places, the gaſtric juice had acceſs to, and of courſe could act upon their contents. When thoſe balls were brought up, or voided downwards, the food within them was found diſſolved either partially or entirely, according to the nature of the food, and the time the balls were allowed to remain in the ſtomach.

Similar experiments to thoſe which Dr. Stevens had made by the means of the above-mentioned pebble ſwallower, the indefatigable and enterpriſing Abbé made on himſelf. He tried many different kinds of

food;—he incloſed the balls in little bags of linen, which allowed the gaſtric fluid to paſs through their perforated ſides, but prevented all fœculent matter from entering during their paſſage along the convoluted pipe of the inteſtines. When the balls were voided, thoſe which contained food of eaſy digeſtion had their contents quite diſſolved, but ſome part of the food of difficult digeſtion remained undiſſolved. Food put into the balls *well maſticated*, was found quite diſſolved, when voided nineteen hours after being ſwallowed: The ſame food put into the balls *unchewed*, and voided in the ſame time, was found not ſo perfectly diſſolved. This demonſtrates in the moſt convincing manner, the utility of carefully chewing the victuals for the purpoſe of facilitating their digeſtion; and the whole of thoſe experiments tend to prove, that no ſuch thing as trituration takes places in the ſtomach of man, or of animals whoſe

ſtomachs

ſtomachs are conſtructed like the human; and of courſe the alternate preſſure* of the diaphragm and the muſcles of the abdomen, which was ſuppoſed to aſſiſt the triturating power, will be conſidered as of little importance in digeſtion.

Thoſe experiments with the hollow balls, although deciſive againſt trituration in the human ſtomach, prove nothing inconſiſtent with the notion of a certain degree of fermentation being requiſite for digeſtion; and this is ſtill the opinion, I underſtand, of ſome phyſicians of reputation.

It ſeems difficult however to imagine, that any fermentation in the victuals can take place in the ſtomach, without our being conſtantly put in mind of it in the moſt

* In inſpiration the ſtomach is preſſed downwards by the diaphragm, and in expiration it is preſſed upwards by the abdominal muſcles.

diſagreeable

diſagreeable manner; yet it is only when people are in ill health, and digeſtion weakened and diſturbed by diſeaſe, that any feeling or effect that can be imputed to fermentation is perceived. In good health, and while we avoid exceſs and improper food, the proceſs of digeſtion is quietly carried on, without our attention being called to it by any diſagreeable ſenſation whatever.

There are three kinds of fermentation deſcribed by chemiſts,—the vinous, the acetous, and the putrid. Vomitings of a vinous ſmell, which ſometimes occur even when no wine has been drunk, and the frequent acid eructations with which ſome people are troubled, are brought as proofs, that the two firſt kinds of fermentation exiſt in the ſtomach, and are neceſſary for digeſtion.

Animal ſubſtances however in no circumſtance, not even in a ſtate of putrefaction,

undergo the acetous or vinous fermentation; when ſour eructations or ſpitting therefore happen after eating meat, they cannot be imputed to the meat: This, with what was formerly remarked, that no ſuch diſagreeable circumſtance attended people in good health, when the digeſtion is in its natural ſtate, renders it moſt probable that thoſe ſymptoms proceed from ſome ſecretion in the ſtomach itſelf, and which only takes place when it is diſordered, and not from any fermentation in the food requiſite for its digeſtion.

The notion that ſome degree of putrefaction is neceſſary to complete digeſtion; and that it actually takes place in the animal part of our food before it leaves the ſtomach, has been combated by various arguments. It has been obſerved that the ſaliva of thoſe who have faſted for a long time is in ſome degree acrimonious; ſo are their other juices; and even their breath, though

though naturally ſweet, is then offenſive; but ſoon after eating the acrimony and offenſiveneſs diſappear.

When a nurſe paſſes too long a time without freſh ſupplies of victuals, her milk becomes rank and bitter, and the child ſhe ſuckles rejects it with diſguſt. Let her take a baſon of freſh broth, and within a ſhort time her breaſts will be filled with ſweet milk, and the child will ſuck with avidity.

From theſe facts it is argued that no degree of putrefaction can take place in any part of the food in the proceſs of digeſtion, becauſe digeſtion is in reality the converſion of the food into chyle, and if putreſcency was neceſſary for that, it would, of courſe, by means of the chyle, be communicated to all the juices of the body; and the breath, ſaliva, and milk, inſtead of being ſweetened,

would be rendered more offenſive in conſequence of eating.

The circumſtances of the bitter alcaleſcent taſte of the ſaliva, the offenſiveneſs of the breath, and ſalt diſagreeable taſte of the milk of nurſes after long faſting, are certainly true; and it is equally true that thoſe qualities are changed and ſweetened in conſequence of eating; but that this happens by the means of the food being converted into chyle, and *that* chyle being mixed with the blood, and diluting and moderating its acrimony, and of courſe ſweetening the juices ſecreted from it, is not very probable; for it muſt take ſeveral hours after eating, before a ſufficient quantity of chyle can be ſeparated from the food and mixed with the blood, during all which time the ſaliva and milk ſhould be growing more and more offenſive, becauſe they are ſecreted from the old blood not yet diluted with freſh chyle;

whereas in reality the change is made in the ſaliva and breath almoſt inſtantaneouſly, and in the milk in leſs than an hour. The ſaliva, breath, and milk becoming ſo ſoon ſweet, muſt therefore proceed from other cauſes, and proves nothing either for or againſt putrefaction being neceſſary for the digeſtion of our food.

But although it does not apply in theſe particular inſtances, the following ſeems a fair preſumptive argument.

Food undergoes nothing akin to putrefaction in the proceſs of digeſtion, becauſe it ſupplies the blood with freſh juices; and if it underwent putrefaction, the addition of chyle, inſtead of diluting and cooling, would naturally render the blood more acrimonious and putreſcent.

But the induſtry of the Abbé Spallanzani, and of an eminent anatomiſt and ſurgeon

of this country, has not left the matter to preſumptive arguments. They have proved by irreſiſtible experiments, that animal food, ſo far from acquiring a putreſcent quality in the ſtomach, if it happens to be tainted when ſwallowed, becomes ſweet and perfectly free from all taint before it is digeſted: from which we may naturally conclude, that the fluid conſtantly exiſting in the ſtomach, called the gaſtric juice, is endowed with an antiſeptic* quality.

The idea formerly taken notice of, that a fermentation is always raiſed by ſome remains of the former meal, ſeems groundleſs, from this circumſtance, that digeſtion is carried on quicker when food is received into an empty ſtomach, than when it is mixed with the remains of any former meal.

In anſwer to this and other arguments urged againſt the notion of fermentation,

* What reſiſts putrefaction.

thoſe

thoſe who ſupport that opinion aſſert, that the digeſtive fermentation, which according to them takes place in the human ſtomach, is of a peculiar kind, unlike either the vinous, acetous, or putrefactive, and not to be judged of by any analogy with them.

This is one way, to be ſure, of getting rid of many objections; but when one thing is ſo unlike another as to have no reſemblance to it at all, I own I am extremely apt to conclude that it is quite a different thing; and if I were permitted, I ſhould chuſe to call it by a different name.

Upon the whole, it ſeems probable, that the gaſtric fluid corrects any tendency to putrefaction that may be in ſome parts of the aliment; and without exciting any evident fermentation, is one of the moſt powerful agents of digeſtion; the proceſs being completed by two fluids which

mingle with the aliment ſoon after its expulſion from the ſtomach, as ſhall be more particularly mentioned hereafter.

It is ſaid that the gaſtric juice has been found to retain this diſſolving power out of the ſtomach; but it being an exceedingly difficult and painful matter to procure this fluid, a ſufficient number of experiments have not yet been made to aſcertain this point.

An obvious and apparently ſtrong objection, however, preſents itſelf to the opinion, that the gaſtric fluid is a menſtruum. If the gaſtric fluid has the power of diſſolving the food, how does the ſtomach itſelf, which is of the ſame nature with ſome parts of our food, remain undiſſolved?

Thoſe who ſupport the doctrine, endeavour to remove this objection, by aſſerting

ing that the mucus which ſheaths the internal coat of the ſtomach is ſufficient to prevent that effect; or if that is denied, they content themſelves with ſaying, it is prevented by ſome peculiarity in the ſtructure of the ſtomach, which we cannot inveſtigate.

Mr. John Hunter, the anatomiſt above alluded to, with more ingenuity, ſuppoſes that the ſame living principle which reſiſts the putreſcent tendency of the blood and other juices, prevents the ſtomach itſelf from being affected by the gaſtric fluid, while it penetrates and diſſolves the aliment. In confirmation of which, he obſerves that worms can remain a conſiderable time unhurt in the ſtomach, while they retain the principle of life; but as ſoon as they loſe this and die, they are diſſolved and digeſted like other ſubſtances. In like manner he aſſerts, that while the ſtomach itſelf retains this living principle, the gaſtric fluid cannot

not affect it; but when the person dies, that fluid immediately begins to corrode it, and sometimes is found to have made its way intirely through the coats of the stomach into the cavity of the abdomen.

There are so many instances in the annals of medicine, of men of the greatest abilities supporting theoretical opinions which have afterwards been found erroneous, that every new notion no doubt ought to be examined with the greatest accuracy before it is fully admitted. The opinion in question, however, must be allowed to be highly ingenious, and has the advantage of an advocate able to do it all justice; so that if it falls, it must be from its own fault, and not his.

After the stomach has retained the food a due time for performing its functions (by whatever means they are performed), and after it has perfectly commingled the various mash,

maſh, and rendered it more homogeneous* to the circulating blood, the whole is ſqueezed through a narrow paſſage called the pylorus, into the firſt of the inteſtines.

The ſtomach being ſhaped ſomewhat like a bagpipe, this paſſage, as well as that by which the food enters the ſtomach, is higher than its bottom: In its way to the pylorus therefore the food muſt proceed contrary to its gravity, which indeed it muſt frequently do afterwards in paſſing along the various convolutions of the inteſtinal canal.

To enable the ſtomach and inteſtines to perform this, they are endowed with a vermicular or periſtaltic movement, by which the food is gradually propelled, and the excrement voided.

As ſoon as the alimentary maſh has left the ſtomach and entered the firſt of the

* Of the ſame nature.

inteſtines,

inteſtines, it meets with the pancreatic juice, and the bile; the firſt ſeparated from the blood by a glandular ſubſtance called pancreas, and the other by the liver, and both poured through the reſpective ducts of thoſe organs into the inteſtine nearly at the ſame place.

The ſubſtance of the pancreas has great analogy with that of the ſalivary glands, and its juice with the ſaliva; the former, however, if we may judge from the comparative ſize of the pancreas and thoſe glands, muſt be ſecreted in far greater quantity. The chief uſe of the pancreatic juice, according to ſome phyſiologiſts, is to dilute the bile, and render that viſcid fluid, which is more acrimonious than any other of the animal juices, more mild and more miſcible with the food.

But to make one juice imperfect and incapable of performing its functions till it is mixed

mixed with another, is very unlike the uſual preciſion and ſimplicity of nature. It ſeems to me therefore more probable, that the pancreatic juice and the bile have diſtinct offices, but both tending to the thorough digeſtion of the aliment.

The bile is a penetrating liquor of the nature of ſoap, capable of diſſolving gums, reſinous ſubſtances, and rendering oily fluids miſcible with water; this ſaponaceous fluid, therefore, is of the greateſt uſe, by mingling with the aliment as it comes from the ſtomach, completing the proceſs begun there, by a more perfect diſſolution of the oily viſcid parts, and giving the various ſubſtances of which our food conſiſts one common appearance and nature, from which an uniform fluid, reſembling emulſion, and called chyle, is ſucked by the lacteal veſſels, and thrown by the thoracic duct into the circulating blood, of which it is immediately to become part.

The

The ſtimulating quality of the bile is likewiſe ſuppoſed to be of ſervice by exciting the periſtaltic motion of the inteſtines, and protruding the coarſe parts of the food through the inteſtinal canal, till they are thrown out of the body in the form of fœces.

The whole account of digeſtion may be thus abridged.——The food being previouſly divided and blended with ſaliva and air by maſtication, is ſwallowed, and meets in the ſtomach with the gaſtric juice, whoſe diſſolving power, aſſiſted by the natural heat of the place, is the principal agent of digeſtion.

The proceſs is completed by the pancreatic juice and bile, the nutritious parts of the food being by this proceſs converted into chyle for the ſupport of the body, and the groſſer parts thrown out.

III.

THE CIRCULATION OF THE BLOOD.

THE next important function of the animal œconomy, and the firſt belonging to the vaſcular ſyſtem we propoſed to conſider, is the Circulation of the Blood.

The heart being the centre and moſt active inſtrument of the blood's circulation, muſt be conſidered as one of the moſt important, perhaps the moſt important part of the body. It is one of the few parts of the body in which a wound is certain death.

Nature has taken care to place thoſe organs, upon which life more immediately depends, in the ſtrongeſt ſituations, and where they are beſt defended from external injuries. Thus the brain is protected by the

the bones of the ſkull; and the heart and lungs are alſo lodged in a bony fortification compoſed of the ribs and vertebræ.

The heart is probably the firſt part that is formed: In examining the incubated egg, the firſt thing that can be perceived is a ſmall red point; and the firſt movement is a motion like a pulſation of that point, which turns out afterwards to be the left ventricle of the heart; the other parts ſeem to be all gradually formed from this.

Obſervations of this nature cannot be made on the human body; but from analogy we ſuppoſe that the ſame circumſtances take place in the human embrio *. The heart has a greater ſhare than any other part, of that ſympathy which has been obſerved to exiſt in the various parts of the body; and which will be mentioned more particularly hereafter.

* The child unfiniſhed in the womb.

No organ of the conſtitution can be *ſeverely* affected without affecting the heart and diſturbing its functions; nor can the heart be *in the ſmalleſt degree* affected without diſturbing every function of the animal œconomy.

But the heart is not only affected by what injures the body, but alſo by whatever ruffles the mind. Rage occaſions frequent and forcible contractions; ſorrow, ſlow and languid ones: And there are inſtances of violent paſſions ſuſpending the contractions of the heart altogether, and occaſioning death. The heart is not only affected by what hurts the body or mind of the perſon to whom it belongs, but alſo by what hurts the bodies or minds of others. But the extent of this kind of ſympathy differs greatly in different perſons. In ſome it embraces children, friends, relations, countrymen, and in a certain degree the whole

human race; in others it ſeems to be entirely confined within the limits of their own bodies, or at moſt reaches with a blunted ſenſibility no farther than to thoſe whom they conceive to be their own offspring.

The human heart is a muſcular ſubſtance of a conical form, ſituated within the cheſt, with its apex or point inclined downwards, and to the left ſide. It is divided by a fleſhy partition into two cavities called ventricles. At the baſis of the heart, on each ſide are placed two little appendixes called auricles, which receive the blood from the veins before it enters into the ventricles, and the circulation is carried on as follows:

Through the left auricle of the heart the blood enters the left ventricle, which contracting, propels it into the large artery, and from thence into the branches, which becoming

becoming ſmaller and ſmaller as they ſpread in infinite ramifications, diffuſe heat and nouriſhment all over the body. Thoſe ramifications terminate in the ſmalleſt order of *blood*-veſſels called capillaries; they pour the blood into the ſmalleſt order of veins, which growing gradually larger as they approach the heart, ſlowly carry back the blood (after the bile, urine, ſpittle, and other juices have been ſucked from it, and after the remainder has been reinforced by the acceſſion of the chyle), and pour it into the right auricle, from whence it flows into the right ventricle;—but before it is allowed to renew its courſe through the body, it is forced, by the contraction of that ventricle, into the pulmonary artery, which immediately ſplitting into innumerable branches, ſpreads over the air-cells of the lungs.—Thoſe cells are the terminations of the branches of the wind-pipe, which receive the air in reſpiration; and being equally ramified with the blood-veſſels, run in con-

tact with them, and form the ſubſtance of the lungs.

The capillary veſſels of the pulmonary artery become the origins of the pulmonary veins, through whoſe gradually enlarging branches, the blood, after undergoing thoſe various changes, is carried back again to the left auricle of the heart, from whence it began its courſe; which courſe the moment it is finiſhed muſt be recommenced as long as life continues. Whatever obſtructs, diſturbs, or renders this circulation irregular in any degree, creates diſeaſe.

The lungs then are a congeries or maſs of air-veſſels, air-cells, arteries, and veins, ſo admirably arranged as to perform their diſtinct functions without confuſion, and yet ſo intimately blended, that no ſingle point could be pierced with the fineſt needle, without piercing all thoſe different kinds of veſſels.

The

The ſingular ſtructure of the lungs, the unexpected courſe which the whole maſs of blood, after having finiſhed its circuit through the body, is obliged to make through this ſingle organ, plainly demonſtrates that ſome very important purpoſe is ſerved by ſuch an uncommon arrangement, and ſuch expence of mechaniſm. As the chyle joins the blood a little before it is thrown into the pulmonary artery, it is imagined, that this ſecond circulation through the lungs is abſolutely neceſſary to complete ſanguification, in other words perfectly to change the properties of the chyle, and mix and blend it with the blood ſo as to form them into one uniform fluid fit for ſecretion, and the other purpoſes of the animal œconomy.

But without farther inquiry into the uſe of this particular circulation, as it will in ſome meaſure be reſumed when we come to treat of reſpiration; we need only ob-

ſerve at preſent that there are ſo many proofs of Nature's accompliſhing the moſt important purpoſes, by the moſt ſimple and beſt adapted means, that we may reſt ſatiſfied ſhe has not deviated from her general rule on this occaſion.

The valves* ſo peculiarly adapted to the entrance of the different ventricles, and to the mouths of the arteries, and which allow the blood to ruſh freely into the ventricles and arteries, but prevent it from regurgitating on their contraction; and indeed the whole wonderful mechaniſm by which torrents of blood arriving from different parts of the body, and meeting at ſo ſmall a point as the

* Thoſe valves are little thin membranes contrived to prevent a reflux of blood when the heart contracts. They are of two kinds; thoſe that terminate the auricles and give a free entrance to the blood from them to the ventricles, but effectually hindering it from being thruſt back by the ſame way; and thoſe of the great arteries, admitting the blood freely from the heart into them, but preventing it from regurgitating into the heart on the contraction of the arteries.

human

human heart, are prevented from ſhocking with each other, and diſturbing the uniform and continued proceſs of circulation, are not more worthy of admiration from the importance of the ends, than for the ſimplicity of the means uſed to accompliſh them.

The motion of the blood through the arteries does not entirely depend on the contracting force of the heart; they have a ſtrong muſcular coat of their own, which after diſtention enables them to contract and aſſiſt the power of the heart. Before death they are ſo much contracted as to thruſt all the blood into the veins.

The heart of man, and of all that are called the more perfect animals, are conſtructed with two ventricles and two auricles, and all of them have a double circulation, one through the body and the other through the lungs, as has been deſcribed.

But there are animals whoſe hearts have two auricles and only one ventricle; in them the circulation is carried on in this manner,—the blood being brought by the pulmonary veins to the left auricle, and by the venæ cavæ into the right, flows from both into the ventricle, and on its contraction part is thrown into the pulmonary artery and the reſt into the aorta, which carry it to the lungs and all over the body, from whence it is brought back by the veins to the auricles. This kind of circulation takes place in the turtle.

There are other animals, particularly cod and all flat fiſh, whoſe hearts have only one auricle and one ventricle; in theſe, when the heart contracts, the blood is thrown into an artery which carries it to the gills, which in fiſh ſerve the purpoſes of lungs; from theſe it returns by the veins, which uniting, throw it into the aorta, by which

it

it is diſperſed over the body, and afterwards being brought back it is thrown by the venæ cavæ into the auricle, and flows from it into the ventricle.

We are told that the heart of one animal is ſtill of a ſimpler conſtruction, conſiſting of only one ventricle and no auricle. This animal, which is a ſpecies of worm called eruca, has no veins, but an artery iſſuing from the heart, and which afterwards branches all over the body; here the blood, inſtead of circulating, is ſaid to flow forward and backward reſponſive to the contraction and dilatation of this reptile's heart. This diſtinction of hearts was firſt made by that diligent and accurate anatomiſt Mr. John Hunter.

Our knowledge of the blood's circulation has perhaps not made ſo great a change in the practice of medicine as might have been expected; but as it has overturned all the falſe theory that was founded upon the ſup-

ſuppoſition that the blood moved in another manner, and prevents any new theory from being admitted that is inconſiſtent with the eſtabliſhed truth of circulation; of courſe all the erroneous practice that was or might be formed on ſuch falſe theories can no longer take place. In the practice of ſurgery, by far the moſt certain part of the healing art, the improvements derived from this diſcovery are great and manifeſt.

By the uſe of the tourniquet alone many operations are rendered ſafer than they were formerly, and many lives preſerved by this and other improvements made upon the ſame principle, which has been peculiarly advantageous to thoſe brave citizens whoſe lives and limbs are ſo often expoſed to the accidents of war.

The circulation of the blood was firſt demonſtrated by Dr. Harvey, about the beginning of the laſt century; a diſcovery which has rendered his name immortal,

and reflected luſtre on the Engliſh nation. Envy could not quietly bear that ſo much honour ſhould fall to the ſhare of any individual. That ſhe might have the pleaſure of tearing them from the brows of Harvey, ſhe was willing to adorn the buſts of the ancients with his laurels. The firſt attack that Harvey's enemies made upon his fame was by aſſerting that the circulation of the blood was known to the ancients. But if the ancients knew it, how came thoſe learned gentlemen who tell us ſo, to have been ignorant of it? Finding that this attack did not ſucceed, it was next inſinuated that Harvey's more immediate predeceſſors had cleared the road, and pointed it out ſo clearly that he could not miſs it.

But all attempts to diminiſh the merit of this diſcovery, by enumerating what was known in anatomy before his time, and by enhancing the advances made by Veſalius, Servetus, and others, are equally vain and invidious. They had done ſo much, it is ſaid,

ſaid, that they had left him *little* to do. But why did thoſe great men leave to another that which would have done themſelves more honour than all their paſt labours?

How infinitely abſurd to call that *little* which thoſe very men whoſe genius and acuteneſs are deſcribed as *prodigious*, could not accompliſh, and which eſcaped the penetration of all the anatomiſts, phyſicians, and philoſophers, that the world produced, till Harvey made the happy diſcovery,—a diſcovery not made, as many uſeful arts have been diſcovered, *by accident*, but in conſequence of deep reflection and careful inveſtigation; by weighing and comparing facts, drawing inferences from the diſcoveries of others, which their authors were unable to do, and advancing ſtep by ſtep to that important demonſtration which has juſtly acquired ſo much honour to the diſcoverer himſelf, and has added dignity to the name of an Engliſhman.

IV.

OF THE SECRETION OR SEPARATION OF PARTICULAR FLUIDS FROM THE BLOOD.

BEFORE we attempt to give any idea of ſecretion in general, or of ſecreted fluids in particular, it is proper to ſay ſomething of the blood itſelf, from which they are all derived.

While blood is in circulation, and for ſome time after it has flowed out of the body, it ſeems an homogeneous red liquor, ſomewhat thicker than water.——While it remains warm it is conſtantly throwing off a watery vapour. After having been a certain time out of the body, whether in a cold or warm air, it thickens into a gelatinous

nous maſs, which ſoon ſeparates into two parts; one ſolid, called craſſamentum, the other liquid, called ſerum.

The craſſamentum conſiſts of a fluid which coagulates ſpontaneouſly, and on that account has been diſtinguiſhed by the name of coagulable lymph, and of another ſubſtance which gives the red colour to the blood. The coagulable lymph may in every ſtate of health be ſeparated from the reſt of the blood by art. In certain diſeaſes it ſeparates naturally.

The buff-coloured coat which appears on the ſurface of blood in rheumatiſms, pleuriſies, and other inflammatory diſeaſes, is no new ſubſtance formed, as was ſuppoſed*, by theſe diſtempers, but merely the coagulable lymph deprived of the red part of the craſſamentum.

* This was clearly proved by the late very ingenious Mr. Hewſon.—Vide his Experimental Inquiries into the Properties of the Blood.

In

In thoſe diſeaſes the blood ſuffers a change, which hinders the lymph from coagulating ſo ſoon as it does in health; when received into a baſon therefore, and ſuffered to reſt, the red particles, being the heavier, gravitate to the bottom before the lymph congeals, and leave it like a buff-coloured jelly on the ſurface; whereas in health the coagulation takes place ſo ſoon after the blood is taken out of the body, that the red part is entangled and prevented from ſeparating, and of courſe the craſſamentum retains the natural colour of blood. From hence we may ſee the reaſon why this inflammatory cruſt, as it is called, is thickeſt when the diſeaſe is moſt violent, wears gradually thinner as the diſeaſe abates, and at laſt intirely diſappears with the complaint. It accounts alſo for this cruſt not appearing on the ſurface of inflamed blood, if it is ſtirred and kept in motion till it congeals.

The

The ſerum is a fluid of a yellowiſh colour, thicker and a little heavier than water. It conſiſts of a kind of mucilaginous ſubſtance diſſolved in water, which contains alſo ſome neutral ſalt.

The mucilage above mentioned, although it does not coagulate ſpontaneouſly on being expoſed to the air, like the lymph of the blood, yet it does coagulate with a certain degree of heat, like the white of an egg.

Acids and alkohol have the ſame effect; but we can hardly ſuppoſe they ever can be received into the circulation in ſufficient quantity to have this effect there; if they ſhould, it is evident, that by putting a ſtop to the circulation, they muſt occaſion immediate death.

The air is a ſtrong coagulant of the blood, producing that effect in a few

minutes, which does not take place, from mere reſt in the veins, for ſeveral hours. It is alſo remarked by Mr. Hewſon that it coagulates at different periods in different conſtitutions and in different diſeaſes.

The ſame gentleman aſſerts, that the diſpoſition of the blood to coagulate increaſes in proportion as the animal is weak; from which he draws this practical inference, that it is improper to rouſe a patient fainting from hemorrhage by ſtimulating medicines, becauſe the languor or faintneſs favours the contraction of the divided arteries and the coagulation of the blood at their bleeding orifices, and thus tends to ſtop the hemorrhage. In this manner blood-letting is often expedient in hemorrhages; for when they are not profuſe, but long continued, the diſpoſition of the blood to coagulate, and of the veſſels to contract, may not be ſufficient; but when the veſſels are emptied ſuddenly by blood-letting, both effects may

be produced, and the hemorrhage ſtopped with the loſs of leſs blood than if veneſection had not been uſed.

To the diſpoſition to coagulate in the body by reſt alone, may be imputed the coagulation found ſometimes in the diſeaſe called aneuriſm*, alſo that in part of the large arteries after amputation, and thoſe called polypi found in the heart and the large veſſels near it. The laſt indeed are generally ſuppoſed not to take place till after death.

Blood diſtilled in a glaſs retort yields water, volatile ſpirit like ſpirit of hartſhorn, inflammable oil, and aſhes which no force of calcination can conſume, but which, by pouring water on them, yield a ſmall quantity of fixed ſalt and ſome earth, amongſt which are found particles ſuppoſed to be of the nature of iron, as they are attracted

* Vide Mr. Hewſon's Experimental Inquiries.

by the loadſtone. The red colour of the blood is thought by ſome to be owing to this ferruginous matter; which opinion they imagine is ſtrengthened by its being obſerved that blood becomes of a more florid colour after a courſe of ſteel medicines.

This notion, however, ſeems to be too haſtily formed, for the ferruginous matter is in very ſmall quantity, no ſolution of iron out of the body is of a red colour, and as to the blood becoming more florid after a courſe of ſteel, it moſt probably has this effect merely as a tonic, for it is certain that the blood is florid in proportion to the ſtrength of the conſtitution.

The craſſamentum and ſerum are in different proportions in different habits.

In the laborious, active, and ſtrong, the craſſamentum is in greater proportion to the ſerum than in the weak and languid.

The ſerum contains a greater proportion of water and ſalt than the craſſamentum, the latter more oil; of courſe when dried it is inflammable.

The proportions of the conſtituent parts of the blood muſt alſo in ſome meaſure depend on the diet.

That the diet influences the health, nobody will call in queſtion, but ſome have fancied that it alſo has a very conſiderable influence on the character and diſpoſition.

Thoſe who entertain this opinion, think that a large proportion of alkaleſcent* ſalts in the blood tend to produce a choleric and fierce turn of mind. In proof of which they obſerve, that birds and beaſts of prey who live conſtantly on animal food, which contains a large proportion of thoſe ſalts, are more fierce than other animals.

* Any ſubſtance which effervesces when mixed with an acid is an alkali.——What has a tendency to this is alkaleſcent.

This,

This, however, probably depends on other cauſes; for if animal food alone, even when taken in aſtoniſhingly great quantities, could produce this effect, many peaceable citizens and worthy aldermen, inſtead of being the quiet worſhipful creatures they are, would be the fierceſt and moſt outrageous animals in the world.

When the blood is examined with a microſcope, it appears not an homogeneous fluid, but ſeems to conſiſt of red globules ſwimming in a clear liquor.

There have been different opinions reſpecting the exact ſhape of thoſe globules; ſome obſervers aſſerting they are of a ſpherical, others of a lenticular* form. When a diſpute commences, men are unwilling to yield, whether the point in queſtion regards their microſcopes or their ſenſes. The

* Of the form of a lens, that is, a round figure, convex on both ſides, but flatter than a ſphere.

controverſy was, as uſual, carried on with great warmth.

While the curious were ſtraining their eyes to aſcertain this important matter, a great philoſopher pronounced that both ſides were in the wrong, for the globules in diſpute were neither ſpherical nor lenticular, but that each conſiſted of ſix ſmall globules adhering together in the form of a mulberry; and that notwithſtanding their appearing of a red colour while adhering, yet each of the ſix ſmall globules, when ſeparate, were not red, but yellowiſh or tranſparent.

The laſt part of the aſſertion could not well be denied; for although the microſcope has been carried to a greater degree of perfection ſince this philoſopher wrote, nobody has been able to perceive this union of the ſix globules; and it is not fair to diſpute the colour of an object till a ſight of it can be obtained.

This

This therefore became a matter of faith rather than of demonſtration; and that believers might have free ſcope for the exerciſe of this virtue, they were farther informed from the ſame authority, that the ſecond order of globules were no more than the firſt, of an uniform ſpherical ſurface, but that each of them was compoſed of ſix globules of a third order, adhering in the ſame manner; and over and above, that it was philoſophical to believe, that the ſubordination does not ſtop here, but that there is a fourth, a fifth, and Heaven knows how many more orders of globules, all in the ſame ſtyle with the firſt, with an equal ſubordination of veſſels adapted for their reception; which beautiful arrangement will become manifeſt as ſoon as our microſcopes are ſufficiently improved to bring it within the ſphere of our viſion. There can be no great harm however, in ſuſpending our abſolute belief till this improvement takes place.

While the blood is in circulation, various liquors are ſeparated from it by a proceſs called Secretion, all theſe ſecretions being neceſſary for the health and preſervation of animal life.

1. The ſemen is ſecreted for the purpoſe of generation.
2. The *liquor amnii*, or fluid in which the fœtus ſwims, contributes to its ſafety and preſervation in the womb, and facilitates its entrance into the world.
3. The milk is ſecreted in the breaſts of women after child-birth for the nouriſhment of the infant.
4. The *urine* and *ſweat*, being excrementitious, are thrown out of the body.
5. The ſaliva, the gaſtric juice, bile, and pancreatic fluid, are all ſubſervient to the purpoſe of digeſtion.
6. The *liquors* which moiſten the cavities of the *thorax* * and *abdomen* †, and the interſtitial

* The cheſt. † The belly.

ſtitial *fluid* of the *cellular membrane*, are contrived to admit of eaſy motion among the viſcera, and prevent the bad effects of attrition. Theſe are alſo the purpoſes of the *liquor* contained within the *pericardium**, and the *watery humour* within the *tunica vaginalis* of the teſticles; without the firſt the conſtant motion of the heart would produce a fatal effect, and by means of the ſecond the moſt delicate organs of the human body are enabled to elude many external injuries to which they would otherwiſe be liable.

7. The unctuous nature and the bitterneſs of that yellow ſubſtance that is ſecreted in the ears, protects them from the invaſion of all kinds of inſects.

8. The mucus which lines the inteſtines and the urethra, ſheaths and defends thoſe canals from the acrimony of the ſubſtances which paſs through them.

* The membranous bag which looſely ſurrounds the heart.

9. The

9. The ſynovia or mucilage which lubricates the joints, is happily placed to allow the heads of the bones to ſlip ſmoothly over each other, and render their motion eaſy.

10. The tears waſh injurious ſubſtances from the eyes, preſerve their tranſparency; and although ſometimes they are expreſſive of the weakneſs of human nature, at others they indicate that ſympathy and benevolence which are its moſt diſtinguiſhed ornament.

The wiſdom diſplayed in providing thoſe various fluids for the preſervation and comfort of animal life, is manifeſt to the dulleſt obſerver;—the means by which they are provided, puzzle the moſt acute.

Such inveſtigations are exceedingly natural to that ſpirit of enquiry, with which, for wiſe purpoſes, the mind of man is endowed; and thoſe phyſiologiſts who have attempted

attempted to explain this and other parts of the animal œconomy, deſerve praiſe for their good intentions, as well as their ingenuity, although they may have often failed in conveying that conviction to the minds of others, which long thought on favourite ſubjects, and the ambition of diſcovery, ſeem to have produced in their own.

I ſhall adjoin however a ſhort view of what is given by ſome of the moſt celebrated phyſiologiſts, as an explanation of the manner in which the animal ſecretions are performed.

The blood, we are reminded, is a mixed liquor, conſiſting of red globules and various fluids of different denſities in which they ſwim. Theſe globules are the largeſt of all the particles which conſtitute the blood. The diameter of the ſmalleſt artery which circulates blood, muſt therefore be larger than that of a red globule; but veſſels or canals whoſe diameters are ſmaller than

than red globules, arise from those arteries; into them, it is evident, no red globule, without unnatural force and stretching, can possibly enter: But the fluids whose particles are smaller than red globules, may in the course of natural circulation enter this smaller order of vessels. And if from the above mentioned secreting vessels a smaller order of canals arise, whose diameters cannot admit one of a thinner nature, the thinner parts of this fluid may enter this third order of canals. In the same manner a fourth and th inner secretion may by the means of a fourth and a smaller order of vessels be separated from the third, a fifth from a fourth, and so on.

It is evident that none of the secreted fluids can be of a red colour; for if a vessel is large enough to admit the red part of the blood, it would of course admit all the other parts, and the contents of the vessel would not be a fluid secreted from the blood, but the

the blood itſelf. It is equally evident by the above account of the matter, that the groſſer ſecretions are made from the ſanguineous arteries, and the finer from veſſels ariſing from them, which ſecretions become finer and finer in proportion to the number of removes the ſecreting veſſels are from the real blood-veſſels.

We are aſſured alſo by ſome phyſiologiſts, that the red globules have no inclination to deviate into the mouths of the ſecretory veſſels, but on the contrary, that they and the denſer particles of the blood in general, have a natural propenſity to keep the middle of the canal, while the thinner particles recede to the ſides, and by that means are more eaſily caught by the ſecretory orifices.

But this method of explaining the myſtery of ſecretion by a ſubordination of veſſels drawing off the thinner, and leaving the thicker fluids of which the blood is

compoſed, and thus forming ſeparate liquors of various kinds, does not account for the ſecretion of thoſe fluids which are thicker than the blood itſelf. Thoſe fluids therefore muſt be ſuppoſed to have been thinner at the moment of ſecretion, and afterwards to have become thicker, which may happen either by the *evaporation* of the watery particles, when the ſecreted fluid is expoſed to the air, as is the caſe with the mucus of the noſe* and the wax of the ears; or by the abſorption of thoſe watery particles, which is ſuppoſed to be performed by the inhaling veſſels of the ducts and canals, through which the ſecreted fluid is obliged to make a tedious, inflected, and circuitous courſe, for the expreſs purpoſe of giving time for the abſorption of the thin particles.

Some of the ſecreted fluids are depoſited in certain receptacles provided for them within the body, where they are kept as in

* That the mucus of the noſe is thin and watery at the inſtant of ſecretion, we know by the effect of ſternutatories.

a ma-

a magazine till there is a demand for them. Thus the bile after its ſeparation from the blood in the liver, is depoſited in the gall-bladder, where it becomes more high-coloured and viſcid; and in like manner the ſemen was ſuppoſed to be depoſited in the ſeminal veſicles, ready prepared for the calls of nature; in confirmation of which it was urged, that in the continent it is of a thicker conſiſtence than in men who are of a different temperament.

But this argument has been overturned by later anatomiſts, who aſſert, and bring ſtrong proofs in confirmation of the aſſertion, that the veſiculæ ſeminales are not a receptacle for ſemen, but that they ſecrete a different fluid. This however comes nearly to the ſame thing, as this fluid is lodged in theſe veſiculæ ready for the calls of nature and purpoſes of generation. And in the ſame manner the milk is kept ready in the large ducts of the mammæ.

In

In attempting to explain what is difficult and abſtruſe, it is not ſurpriſing that every circumſtance is laid hold of that can poſſibly be ſuppoſed to aſſiſt in making it out; accordingly we are told that the nature of the ſecreted fluid depends in ſome meaſure upon the angle which the ſecreting duct makes with the trunk from which it branches; and as the veſſels are detached at a great diverſity of angles, and are ramified in various manners, and as Nature does nothing in vain, the concluſion is drawn, that this variety of angles and ramifications aſſiſt in producing the variety of ſecreted fluids. Men are too apt to miſtake their own fancies for the aims of Nature. To allow therefore, that Nature does nothing in vain, and to admit all that is above aſſerted, are very different conceſſions; for there may be very good uſes anſwered by diſtributing the ſmall branches of arteries in different manners to different viſcera, although the varying the ſecreted fluids is

not

not one of them; beſides, it affords but little ſatisfaction to be perſuaded, that the variety of the one really contributed to the variety in the other, if, after all, we cannot form an idea *how* it contributes.

To make this matter a little clearer, and to account in ſome degree for the different fluids ſecreted in different parts of the body, it has been aſſerted that the blood which arrives at the various places of ſecretion is of a nature and quality ſimilar to the humour *there* to be ſecreted. Blood, when it firſt iſſues from the heart, before any of the ſecretions have taken place, is ſuppoſed to be more watery than afterwards, and on that account, we are told, the emulgent arteries, from which the urine is ſecreted, are placed near the heart.

The mammary arteries of nurſes, it is ſaid, are more plentifully furniſhed with chyle than any others; and therefore the

milk, a liquor reſembling chyle in many particulars, is ſecreted from them.

The bile, an oily and acrimonious ſecretion, is ſecreted from the blood returning *ſluggiſhly* loaded with *oil, and contaminated with rancid effluvia* from the omentum and other viſcera of the lower belly. And to crown the whole, we are aſſured that the blood carried by the carotid arteries to the brain, is of a more *ſpirituous* and *refined* nature than any of the reſt of the maſs, for this very ſufficient reaſon, that the *animal ſpirits*, which are the moſt refined of all poſſible fluids, are ſecreted there.

All this is fanciful and well arranged, but would be more convincing, if upon examination the blood of the emulgent arteries were really found more full of water than the blood of other arteries, or if the blood of the vena portarum* were not found the

* The veſſel which carries the blood from the viſcera of the lower belly to the liver.

ſame

ſame in all reſpects with blood returning by the veins from all the other parts of the body. Had the blood in the firſt caſe been ſenſibly impregnated with urinous, and that of the ſecond with bilious particles, it might have been natural to have judged *à priori*, that urine would be drawn from the one and bile from the other; but as previouſly to the ſecretions, no ſuch particles can be found, the matter ſeems rather darker after the explanation than it was before.

As to the aſſertion concerning the ſpirituous quality of that portion of blood carried by the carotids to the brain, the argument ſtands nearly in this way:

The blood ſent to the brain is more ſpirituous and refined than the reſt of the maſs.

I do not find it ſo.

Yes, but it muſt be ſo.

Why?

Becauſe the animal ſpirits are ſecreted from it, and all the world knows that the animal ſpirits are the moſt refined of all fluids.

Where is this fluid?

In the nerves.

Cut a large nerve, and ſhew it to me.

You cannot ſee it, it is ſo refined.

That is unlucky.

On the contrary it is the moſt fortunate thing in the world; if we could ſee it, it would be good for nothing; but we are ſure it is there.

How ſo?

How ſo? For what other purpoſe but the ſecretion of this fine ætherial fluid would the moſt ſpirituous part of the blood be ſent by the carotids to the brain? So that it is clear from this circular demonſtration, that the moſt refined part of the blood goes to the brain, becauſe the animal ſpirits are ſecreted; and that the animal ſpirits are ſecreted there, becauſe the moſt refined part of the blood goes to the brain.

The

The notion that the mammary arteries of nurſes are more plentifully ſtored with chyle than the other arteries of the body, has ariſen on no better foundation.

The blood of thoſe arteries has never been actually found impregnated with a greater proportion of chyle than that of others; but as on perceiving that the urine, a watery liquor, is ſecreted by the kidneys, and the bile an oily one, by the liver, it is concluded that the blood which goes directly to thoſe two organs is fuller of *watery* and *bilious* particles than the reſt of the maſs; ſo on finding that milk, a fluid reſembling chyle, is ſecreted in the breaſts of nurſes, it is taken for granted that the blood of their mammary arteries is uncommonly full of chyle.

It would appear indeed, that the chyle is a conſiderable time before it changes its nature, and is aſſimilated into the maſs of

blood; for when blood is drawn after a plentiful meal, the ſerum is of a whiter colour than uſual, owing in all probability to the freſh abſorbed chyle's not being perfectly aſſimilated; but this regards the maſs of blood in general, and not that of the mammary arteries in particular. It is certain however, that when a nurſe is kept too long from food, and her breaſts almoſt entirely drained of milk, what little is found there contains an unuſual quantity of ſalt, and is rejected by the infant with ſigns of diſguſt; yet within three quarters of an hour or an hour after eating a competent quantity of freſh broth, her breaſts will be repleniſhed with milk, and the child will ſuck with ſatisfaction and avidity. In this caſe the food received into the ſtomach, if not the immediate ſource of the milk, ſeems at leaſt the cauſe of the breaſts being filled with that liquor; but the ſhortneſs of the interval between the cauſe and effect ſeems ſurpriſing, and difficult to be accounted for.

We

We cannot ſuppoſe that this food is digeſted, converted into chyle, this chyle thrown in the common way into the maſs of blood, and ſecreted in the form of milk from the mammary arteries; for the proceſs of digeſtion alone muſt engroſs much more time than the whole interval in queſtion. But even upon the ſuppoſition that the digeſtion could be completed and the chyle formed from the food within that interval, this would not remove the difficulty. Let us conſider the journey the chyle has to make before it arrives at the breaſts: It is firſt carried into the thoracic duct, thence into the ſubclavian vein to be mingled with the blood; from the ſubclavian vein it flows into the vena cava, paſſes through the heart, then through the lungs, returns and paſſes again through the heart into the aorta, and is diſtributed all over the body, the common proportion only going to the mammary arteries, from whence the chyle is ſecreted. When we think on all this, and recollect alſo that the chyle falls drop

by drop into the ſubclavian vein, and is mingled in this circuitous courſe with the blood of the whole body, we cannot poſſibly conceive that the proportion of chyle formed from this ſingle meal, which falls to the ſhare of the mammary arteries, is the entire ſource of this copious flow of milk. Others ſuppoſe that the broth, without waiting the uſual proceſs of digeſtion, is abſorbed by the lacteals of the nurſe's ſtomach, and carried directly to the thoracic duct, and ſo into the blood. But this ſuppoſition, even if granted, would only cut off the time taken up in digeſtion, and leave the other objections in full force.

The fact being certain, and all theſe methods of accounting for it unſatisfactory, ſome have ſuſpected that there is a ſecret conveyance undetected by anatomiſts, by which this nouriſhment is ſmuggled from the nurſe's ſtomach to her breaſts, and there converted into milk without being previouſly either changed into chyle or blood.

But

But to this wild hypotheſis ſtronger objections ariſe than to any of the preceding. It ſuppoſes a fluid to be ſecreted, and not from the blood, which is contrary to the rule obſerved by Nature in the other ſecretions, all of which are formed from the blood, and it renders the mammary arteries almoſt entirely uſeleſs.

When the ſtomach is empty, ſtill there is ſome milk ſecreted, although in ſmall quantity and of a bad quality; if therefore we admit this hypotheſis, there muſt be two ways of ſecreting milk, one directly, from the nouriſhment in the ſtomach, and the other, when no nouriſhment is in the ſtomach, from the blood in the mammary arteries.

And finally, to ſuppoſe a direct paſſage from the ſtomach to the breaſts unobſerved by anatomiſts, implies a degree of careleſſneſs and want of attention, which ill accords with that ſpirit of minute inveſtigation

tion and ardour for diſcovery, by which this claſs of men are peculiarly diſtinguiſhed.

A ſudden and profuſe ſecretion of milk, after all, is not more difficult to be accounted for than the ſudden and profuſe ſecretion of tears which in ſome people attends pain and grief, or than the great augmentation of ſome other ſecretions from various exciting cauſes.

What is ſingular in the inſtance of milk, and occaſions the peculiar difficulty, is, that its augmented ſecretion ſo immediately follows eating, that we are tempted to think, in ſpite of reaſon and anatomy, that it is the identical food received in the ſtomach, which in leſs than an hour after flows from the nurſe's breaſts in the form of milk.—Difficulties unqueſtionably attend every explanation that has been given of this phenomenon. The following ſeems liable to the feweſt, is the moſt ſimple, and I imagine the moſt probable.

When

When the nurſe is faint from hunger, her circulation, as that of every perſon in the ſame ſtate muſt be, is languid, and of courſe all the ſecretions are diminiſhed; but after ſhe has received a ſufficient quantity of nouriſhing liquid food, it inſtantly acts as a ſtimulating cordial to the nerves of the ſtomach, with which all the nerves of the body have a wonderful ſympathy; the circulation is quickened, every ſecretion is in ſome degree encreaſed, part of the food is abſorbed and carried into the circulation ſoon after it is ſwallowed, which cauſes a general fulneſs of the blood-veſſels; the mammary arteries enlarge and carry blood more rapidly and in greater quantities to the breaſts; they are ſtimulated to ſecrete more in proportion than other glands, and thus the breaſts of an exhauſted nurſe are filled with milk ſoon after a nouriſhing and reſtorative meal.

A glaſs of wine in ſome meaſure has the ſame effect; it gives the cordial ſtimulus to the

the nerves of the ſtomach, increaſes the circulation, and promotes ſecretion, but it does not keep up the ſecretion by pouring freſh juices into the blood. The effects of the wine decreaſe every moment after the firſt exertion of the conſtitutional powers it excites: The effects of a nouriſhing meal are more copious and permanent.

If however it is aſked, how this ſtimulus is given to the breaſts in particular, or why a plentiful meal ſhould be followed by a flow of milk, rather than of any other of the ſecreted juices, no ſatisfactory anſwer can be given, more than if it were aſked why the breaſts of women ſecrete milk after labour, and not before. We ſee the beſt reaſons why it ſhould be ſo, although we cannot diſcover by what means it is brought about; we muſt not attempt to explain final cauſes.

To return to the ſubject of ſecretion: In whatever way the ſecreted fluids are ſepa-

rated

rated from the blood, or however their component particles are combined, it is certain that the ſecretion of ſome of thoſe fluids is performed with, and in others without, the mediation of certain ſubſtances called glands.

The ſaliva, tears, bile, ſemen, urine, and ſome other fluids, are of the firſt claſs; the lymph and the fluid thrown out of the body by ſenſible and inſenſible perſpiration, of the ſecond.

Theſe laſt, as has been generally thought, are ſecreted from the blood without the aid of glands, and merely by the mechaniſm above-deſcribed, of ſmaller veſſels branching from larger ones, and draining a thinner from a thicker liquor.

The former are ſeparated by the intervention of glandular ſubſtances of one kind or other; for we always find ſuch ſubſtances at the places where thoſe ſecretions are formed.

formed. We can ſee the ſecreted fluid flowing from them by a pipe called the excretory duct; we know that the gently touching or preſſing certain glands promotes the ſecretion; and we know that when the glands are obſtructed, or deſtroyed by diſeaſe, or entirely cut from the body, the ſecretion no longer takes place; ſo that there can be no ſhadow of doubt that glands are the agents of the ſecretion of the fluids in queſtion.

A gland then is a ſubſtance contrived for the purpoſe of ſeparating ſome particular liquor from the blood; it is generally of a ſmooth ſurface, and ſeparated from the adjacent parts by a fine membranous coat, which admits an artery and nerve to enter, and a vein to iſſue, along with a canal called the excretory duct of the gland.—They are either ſimple, in the language of anatomiſts conglobate; or compound, otherwiſe called conglomerate.

The latter conſiſts of a number of the former joined together in a cluſter, each glandule of which has its diſtinct excretory duct; theſe afterwards uniting, ſometimes form three or four, and ſometimes one large excretory canal.

As injections may be puſhed from the arteries that ſeem to enter the ſubſtance of the glands, quite through to their excretory ducts, it is thought that the ſubſtance of glands is nothing but a congeries and convolution of arteries, adhering ſome more ſome leſs compactly, connected by an intervening cellular membrane, and terminating in an excretory duct. The vein which iſſues from the gland with the duct, conveys away the ſuperfluous blood that remains after the ſecreted fluid is formed.

Such of the ſecreted fluids as are ſuppoſed to exiſt in the blood previous to ſecretion, and to be only mechanically mixed

by

by the force of circulation, may, it is thought, be mechanically ſeparated either without the intervention of glands, as the ſweat, or by their means, as the urine and tears.—But there is more difficulty with thoſe fluids which are thought not previouſly to have exiſted in the blood, and therefore could not be drawn from it by any arrangement of ſubordinate veſſels, or any mechanical power whatever. The ſaliva, the ſemen, the bile, the pancreatic juice, and ſome others, it is imagined are of this claſs. By what power, it is aſked, can the glands, from whoſe excretory ducts thoſe fluids iſſue, produce liquors from the blood, which did not previouſly exiſt in it?

It was an ancient opinion, and is ſtill the opinion of ſome phyſicians, that thoſe fluids are formed in their reſpective ſecretory organs by the chemical operation of fermentation; by which term they mean ſome kind of change either by effervescence, coagulation,

tion, ſolution, precipitation, or otherwiſe, which the ſecreted fluid undergoes in the gland, by mixing with ſomething of the nature of a ferment, which each gland contains.—Others treat this notion with deriſion, declaring that neither the blood nor any of the juices ſeparated from it, are acid or alkali; that none of them can effervesce with acids or with alkalis, nor with each other, or by any of the other means produce the changes in queſtion.

To which the ſupporters of the doctrine of ferments reply, that the particular ferment belonging to each gland is in ſuch a ſmall quantity, that no experiment can be tried upon it to aſcertain what its nature is, or what are its powers; and when the blood arrives at the organ, the change immediately takes place, and the ſecreted fluid is formed. But this ſuppoſed ferment implies a previous ferment to form it, and that

again another of elder date, and ſo the *elephant is ſupported on the back of a tortoiſe*, and the weight and perplexity is doubled.

What then is the reſult of the whole matter? Why, that every theory hitherto offered as an explanation of the manner in which the ſecretions are made, is liable to ſuch unſurmountable objections, that it is evident the proceſs is not underſtood. It may be aſked, why is not this acknowledged at once? and when people plainly ſee they do not underſtand a ſubject, why do they not fairly own it, and ſave farther trouble to themſelves and others?

That, to be ſure, is the moſt ſimple and the moſt candid method, and is followed by ſome; but all the men of a learned profeſſion and ſolemn character are not fond of adopting it; they poſſibly think it puts them too much on a level with thoſe who have not ſuch advantages.

However

However myſterious a ſubject may be, and however little light they can throw upon it, ſtill they can talk about it and about it; they can, in ſupport of their ſyſtems, bring conjectures in place of facts, and aſſertions for proofs; and when very hard puſhed, they can call veteran phraſes from Greece and many frightful words to their aſſiſtance, till at laſt they raiſe ſuch a cloud of technical duſt, as conceals their ignorance, blinds the ſpectator, and makes him imagine that the myſtery has been fully explained, although *he* has not capacity enough to follow and comprehend the demonſtration.

When we get clear of this duſt however, and conſider the ſubject uninfluenced by ſyſtem or early prejudices, we are confounded to perceive how very ignorant indeed the moſt knowing are.

Yet it is right to know what has been thought on ſubjects of this nature, becauſe

in tracing the labyrinths of erroneous ſyſtems, a clue is ſometimes found, which leads to the truth.

To return to our ſubject: If it is ſaid that thoſe ſecreted fluids which are known to be only mechanically mixed in the blood, by the motion and jumble of circulation, may be mechanically ſeparated by the mere ſubordination of veſſels; and that glands are only neceſſary when a great change is to be made, and a new fluid, as it were, formed. The inſtance of the urine however, overturns this idea, it being a fluid which comes under the preceding deſcription, where glands ſeem not neceſſary, but which nevertheleſs is ſeparated by glands. The urine and the ſweat are of the ſame nature with each other, and, as far as we can inveſtigate them, they conſiſt of the ſame ſubſtances; yet the firſt is ſecreted by glands, and the other without. In general, however, it is true, that the fluids ſecreted

by

by the intervention of glands are very different from the ſubſtances found in the blood, and what it ſeems impoſſible to imagine could be *mechanically* ſtrained or ſeparated from it; thoſe organs rather *appearing* to have a chemical or magic power of forming a new fluid, totally different from any thing that could have been expected to be formed from blood, or any of the juices of which it is compoſed. What can be more different from blood than bile? Yet, as it has been already obſerved, the blood carried to the liver is the ſame in all ſenſible qualities with the reſt of the blood in the veins; and this gall, which can only be formed in the ſecretory veſſels of the liver, being once formed there, can afterwards be taken up by all the ſecretory organs; and in the jaundice is evidently to be ſeen in all the ſecretions. In ſhort, we perceive that a moſt wonderful change is made in the blood that is carried to certain glands; but we neither know how this

change is performed, nor have we any conception what circumſtance makes glands neceſſary for ſecretion; nor can we perceive any thing in their ſtructure that can lead us to preſume *à priori*, that any one of the ſecreted liquors ſhould neceſſarily be ſecreted by any one of the ſecreting organs, rather than by another; for any thing that *we* can perceive, milk might have been ſecreted by the liver,—bile by the glands of the breaſt,—ſaliva by the kidneys, and ſo on.

It is true, we do ſee moſt evidently that they are infinitely better arranged; but our diſcernment does not enable us to perceive on what particular circumſtance this admirable arrangement immediately depends.

Nor have we any idea how it happens that chyle, apparently the ſame, is formed from all the various kinds of food that mankind eat: Let them be fed on animal food alone, on vegetable food alone, or on a mixture

mixture of both, ſtill the bland white fluid called chyle will be abſorbed from them all. The milk of a nurſe is ſtill milk, with little or no apparent difference whether the woman is fed on roaſt beef, oatmeal, or potatoes.—Some one of theſe may, it is true, be more wholeſome than the others, or a mixture of all may be preferable to any one; but whether the nurſe is confined to one, or allowed to feed on all, her milk will be eſſentially the ſame.

The formation of chyle and milk ſeems to be ſomething very different then from ſimply ſeparating by a ſubordination of veſſels, or by any other means, the thinner from the thicker parts of a heterogeneous* liquor; for if that alone were the caſe, we ſhould naturally expect to find a different kind of chyle drawn from every different kind of food. Whereas the lacteals ſeem to

* Of various natures.

poſſeſs, in the very moment of abſorption, the power of aſſimilating into one uniform fluid, all that infinite variety of different ſubſtances, which the voracity or caprice of mankind has appropriated for their food. But we know not on what principle this depends; neither have we any conception by what means the human conſtitution converts vegetable and animal ſubſtances, the firſt with nearly as much facility as the ſecond, into part of itſelf.

This, to be ſure, is very wonderful; but not more ſo than that a beech or oak ſapling ſhould by their roots, which contain *their* abſorbing veſſels, imbibe the juices from the earth, and convert them into the ſubſtance of beech and oak.—— How do the ſeeds thrown into the earth gradually increaſe in ſize, and ſpringing from the ſame ſoil, take the various forms of all the different trees and vegetables?—— How does the branch of one tree, engrafted

on

on the branch of another, produce a different fruit from that of the trunk?—— How do the abſorbing veſſels of a pear branch draw juices out of an apple-tree, which are converted into pears, while every other branch ſends forth apples? All this remains unexplained. I therefore cannot be ſurpriſed, however much I may regret it, that it alſo remains unexplained how the various ſecretions are performed, or how the liver converts the ſame liquor into bile, from which other glands form mucus, or ſemen, or ſaliva.

V.

ABSORPTION.

ABSORPTION is the next function of the vascular system to be considered.

This is performed by a set of vessels called absorbent, smaller, and, if possible, more numerous than the blood-vessels.

Some of those vessels, it is said, have been occasionally seen and vaguely mentioned by the earliest medical writers; but those who assert this must acknowledge that those writers had no idea of their use, but speak of them in such a cursory manner that it is very doubtful whether they mean the vessels in question or not.

There are two kinds of absorbents, the lacteals and the lymphatics, each of them deriving

deriving their name from the appearance of the fluids they contain; the firſt being of a milky colour, the ſecond pellucid.

About the beginning of the laſt century, *Aſellius* diſcovered the former, and gave them the name they ſtill have. Towards the middle of that century, *Pequet* traced them to the thoracic duct, and diſcovered that from thence their contents are carried to the ſubclavian vein, and not to the liver, as was till then believed. Rudbec, Bartholin, and others, about the ſame time demonſtrated the ſecond part of the abſorbent ſyſtem, called lymphatic, which has been more accurately examined by ſucceeding phyſicians, and whoſe nature lately, in a peculiar manner, engaged the attention of the moſt celebrated anatomiſts of this iſland.

The lacteals ariſe from the internal ſurface of the ſtomach and the alimentary canal; their office is to imbibe the moſt nutritious

tritious and fineſt part of the food (the chyle), and carry it to a reſervoir where they all terminate, called the thoracic duct.

In their progreſs from the bowels to this duct, the lacteals paſs along a membrane called the meſentery, to which the inteſtines are attached in ſuch a manner as prevents their being entangled; an accident to which ſo very long and ſo very flexible a pipe, confined in ſuch ſmall bounds, would otherwiſe be very liable.

There are a great many little ſubſtances, called meſenteric glands, diſperſed over this membrane. The lacteals paſs through theſe glands, in their way to the thoracic duct.

Theſe glands, therefore, divide the lacteals into two portions;—that from the inteſtines to the glands, called by ſome the firſt, and that from the glands to the thoracic duct, called the ſecond order of lacteals.

The whole alimentary canal is a continued pipe, whoſe various windings and circumvolutions

volutions within the belly prolong it generally to at leaſt ſix times the length of the perſon to whom it belongs.

Though but a ſingle pipe, we talk of it in the plural number, becauſe it is divided by anatomiſts into ſix portions, to each of which they have given a name. Three of theſe form what are called the ſmall guts—the remaining three, the great. The former make by much the longeſt portion of the whole canal, and there the lacteals are moſt numerous.

There are, however, a conſiderable number in the colon, which is the firſt of the large inteſtines, but few or none in the remaining two.

The wiſdom of this is obvious and ſtriking; for the food, by the time it arrives at the two laſt of the inteſtines, being almoſt entirely deprived of its nutritious juice, what remains begins to acquire an excrementitious

taint, and is therefore improper to be abſorbed and mixed with the blood.

The lacteal veſſels which are found in the colon, and the few ſuppoſed to be in the two other large inteſtines, though in ſmall numbers, ſuggeſted the practice of injecting clyſters of nouriſhing broth and milk, in thoſe diſeaſes which deſtroy the power of ſwallowing. By the abſorption of part of thoſe injections, which may be thrown up as high as the colon, the patient has been ſupported till ſuch time as the difficulty or impoſſibility of ſwallowing food was removed.

From this deſcription it is evident, that whatever obſtructs the paſſage of the chyle, and prevents it from being mixed with the blood, hinders the nouriſhment of the body as effectually as if no victuals were allowed to enter the ſtomach.

For

For although a perſon ſhould eat plentifully of the moſt nouriſhing food, and although that food ſhould be properly digeſted in his ſtomach and bowels, yet if the glands of the meſentery, through which the lacteals paſs, are ſwelled and obſtructed, the chyle will get no farther, the blood will receive no freſh ſupplies, and the body, of courſe, muſt waſte away and ſoon periſh.

I have ſeen ſome remarkable inſtances of this ſpecies of conſumption; one in particular, from various circumſtances, made an indelible impreſſion on my memory,—the caſe of a youth of fifteen years of age, diſtinguiſhed by more brilliant perſonal advantages and nobler endowments of mind than I ever ſaw united at that period of life*. Aſſiſted by the advice of Dr. Cullen,

* Thoſe particulars are foreign, no doubt, to the purpoſe of a work of this kind, and will perhaps be criticized as improper—let them.—At the diſtance of ſixteen years, I have never yet, without ſome ſuch impropriety, been able to mention this young man——

"By me, ſo Heaven will have it, always mourn'd
"And always honour'd.——

I at-

I attended this youth with the moſt anxious care through the whole progreſs of his diſeaſe. In the bloom of health, without any apparent cauſe, he was obſerved to loſe fleſh and gradually to waſte away, although he complained of no particular uneaſineſs, had a ſtrong appetite, and was indulged in a ſufficient quanity of proper food. He retained his ſpirits to the laſt; but daily loſt his fleſh and ſtrength, and at laſt expired without pain. On opening his body, all the viſcera of the breaſt were found perfectly ſound. The contents of the abdomen were all in the ſame condition, except the glands of the meſentery, which were ſwelled greatly beyond their natural ſize, and to all appearance entirely obſtructed. No other cauſe could be aſſigned for the death of this youth but the chyle being ſtopped at thoſe glands, and excluded from the blood; ſo that he literally died for want of nouriſhment.

Some

Some late anatomiſts aſſert that they have traced lacteals, in ſome particular ſubjects, all the way to the thoracic duct, without their paſſing through any of the meſenteric glands. This has not been obſerved, however, by others equally celebrated; ſo that ſuch caſes muſt be very rare; and even in the ſubjects where it was obſerved, only a very few were in this predicament; infinitely the greater number paſſing in the uſual way, through the meſenteric glands.

The other kind of abſorbents, called lymphatics, ariſe from the internal ſurface of the breaſt, belly, and every cavity of the body; they alſo overſpread the whole external ſurface of the body; and large lymphatic veſſels are uſually found cloſe to the large blood-veſſels of the extremities, beſides thoſe ſmall ſuperficial ones which lie above the muſcles in the cellular membrane.

The large viſcera generally have two ſets of lymphatics, one lying on the ſurface of the viſcus, and the other accompanying the blood-veſſels belonging to it.

That the uſe of the lacteals is to abſorb the chyle from the food, and tranſmit it to the blood, has never been queſtioned. How could it? it admits of demonſtration.—A few hours after an animal has been fed on milk, the ſame fluid found in the inteſtines is alſo ſeen in the lacteals.

As the lacteals and lymphatics are parts of the ſame ſyſtem, when it was proved that the former were abſorbent veſſels, one might naturally have thought the ſecond would alſo have been conſidered as ſuch. This was not, however, the original opinion. It was imagined, on the contrary, that the lymphatics were not abſorbents, but a kind of veins formed for the purpoſe of carrying the lymph from ſuch arteries, as, being too ſmall

ſmall for circulating red blood, or even ſerum, admit lymph only.

The theory of the gradation of globules, it is probable, had a conſiderable effect in confirming and ſpreading this opinion, which kept its ground, and was general even after Gliſſon, Hoffman, and others, had pointed out the real uſe of the lymphatics.

The faculty of abſorption, although refuſed to the lymphatics, was aſcribed, by many anatomiſts, to common veins; and this opinion continued to prevail, in ſome degree, until Hunter and Monro totally overturned it, exploding at the ſame time the notion that any of the lymphatics are continuations of arteries, and eſtabliſhing, beyond a doubt, that all are abſorbent veſſels. The chief arguments for this opinion are:

1. The reſemblance, in ſtructure, between the lacteals which are proved to be abſorbents, and the lymphatics.

2. Both paſſing through glands.
3. Both terminating in the thoracic duct.
4. Both beginning from cavities, the lacteals from the cavities of the inteſtines, the lymphatics from the other cavities of the body.
5. The tranſmiſſion of the venereal and other poiſons, from the ſkin into the conſtitution; as well as that of the virus of the ſmall-pox, in inoculation—for this muſt be done by abſorption; and that this abſorption is performed by the lymphatics, ſeems highly probable, becauſe the lymphatic veſſels, and the glands through which they paſs, are on thoſe occaſions found inflamed and ſwelled.

When the venereal infection, for inſtance, is received in the uſual way, the lymphatic gland in the groin is apt to inflame, and form what is called a bubo. When the ſame (as ſometimes happens) is received at a ſcratch or open wound in the finger, the

lymphatic in the armpit is as apt to inflame and ſuppurate; becauſe, in the firſt caſe, the abſorbing lymphatic paſſes through the glands of the groin, and, in the ſecond, through thoſe of the armpit.

It alſo has been obſerved that when the infection is communicated by the lips, the glands of the neck ſwell and are inflamed.

Abſceſſes ſometimes occur in the armpit after inoculation, for the ſame reaſon; and this was more frequently the caſe formerly, when a longer inciſion than at preſent was uſed.

When the abſorbing power of the lymphatics was thus put beyond the reach of cavil, it was next aſſerted, that "although "they are abſorbents, yet the veins are ab- "ſorbents alſo, the firſt being a mere "appendage to the laſt; for that the lym- "phatics are too few in number to perform "alone ſuch an important office;" beſides, it was added, "there are ſome parts of the "body without lymphatics altogether."

The perſevering labours of ſome late anatomiſts, particularly thoſe of Mr. Cruikſhank, have entirely removed the firſt objection: The reſearches of this gentleman alone demonſtrate that the lymphatic veſſels are more numerous than the veins. And with reſpect to the ſecond, I underſtand he has traced thoſe veſſels to every part of the body except to the brain, the delicate ſtructure of that organ putting a ſtop to the inveſtigation; but this accurate phyſiologiſt has done all that perhaps is poſſible, to prove that the brain is furniſhed with theſe veſſels alſo, having diſcovered glands at the baſis of the ſkull through which there is every reaſon to think that lymphatic veſſels paſs from the brain.

The faculty of abſorption being at length yielded excluſively to the lymphatics and lacteals, the ſtructure of their mouths, and the means by which they are enabled to perform their functions, became a ſubject of much inveſtigation and diſpute.

Mr.

Mr. Cruikſhank, by the means of microſcopes, ſaw the mouths of the abſorbents, which he deſcribes as ariſing from all the ſurfaces and cells of the body, in the ſame manner that they aroſe from the ſurfaces and cells of the abſorbent glands, that is, by ſmall orifices. Six, eight, or ten of theſe orifices belong to as many ſmall branches, which unite in forming the abſorbent veſſel.

Some phyſiologiſts imagine that their mouths being always open, fluids aſcend into them, on the ſame principle that they aſcend into capillary tubes.

Others imagine that the mouths of the abſorbent veſſels draw in liquor by forming a vacuum, in the ſame manner that is done by the mouths of infants on the breaſt, in the act of ſucking.

The veſſels in queſtion are ſo minute that they have baffled every attempt that has hitherto been made, even by means of the miſcroſcope, of aſcertaining the ſtructure

of their mouths. The curious inveſtigators therefore being able to procure no idea of their manner of operating, by the means of their eyes, have been obliged to have recourſe to their imagination—and it muſt be owned that ſome of them have made uſe of the latitude which that affords with the utmoſt liberality. Theſe veſſels certainly ſeem to ſhew ſome ſelection with reſpect to the liquors they take in; they always abſorb the nutritive part of the food in the firſt place, and never take any of the excrementitious but in the laſt extremity, and when nothing elſe can be had. And the force of their mouths is quite aſtoniſhing, and far ſurpaſſes what is diſplayed by any other veſſels. Experiments with madder, to be mentioned hereafter, prove that their power of abſorption is not confined to fluids.—— And the phenomena of thoſe experiments cannot be accounted for without admitting that they abſorb the ſolid bones themſelves.

Other

Other obſervations confirm this, and prove that there is a conſtant abſorption and renewal of every part of the body without exception.

The firſt ſet of teeth that children receive have roots or fangs as well as the ſecond; when they ſhed the firſt ſet however, no roots are to be ſeen, of courſe they muſt have been abſorbed. In very old people, their teeth ſometimes drop out, from no other cauſe, but becauſe the alveolar proceſſes, or bony ſockets, are entirely abſorbed.

Some phyſiologiſts not being able to conceive how the mouths of any kind of veſſels could poſſibly deſtroy hard bony ſubſtances, have ſuppoſed that a menſtruum is ſeparated from the blood or from ſome of the juices, which diſſolves the bones.

In this inſtance it happens, as it often does to thoſe who, elated by philoſophical pride, refuſe to believe what they cannot com-

comprehend, they are forced to admit what is equally if not more incomprehenſible.

The phyſiologiſts above mentioned, cannot believe that the mouths of veſſels can gradually and imperceptibly deſtroy the compact ſubſtance of bones, but they can believe that veſſels ſecrete a menſtruum of ſuch a corroſive nature as to deſtroy the hardeſt bones, but which is not capable of injuring their own ſoft and pliant ſubſtance. In whatever way they are to be explained, the powers and faculties of theſe veſſels are ſo wonderful, as almoſt to juſtify the opinion of that gentleman who declares himſelf in equal admiration of the force their teeth diſplay in deſtroying bones, and the good ſenſe the veſſels themſelves diſplay in the choice of aliment.

But after all, is it more difficult to underſtand how abſorbents remove bones, than how arteries have depoſited them?—When

the greateſt philoſopher has fully explained the latter, a man of plain ſenſe may ſafely undertake to account for the former.

The liquor tranſmitted from the blood through ſmall exhalent arteries or organized paſſages, into the different cavities of the body, we formerly obſerved, ſerves various uſeful purpoſes.

The continual beating of the heart, and the frequent movement of the joints, makes it peculiarly neceſſary that they ſhould be kept conſtantly moiſt. The former is accordingly ſuſpended in a membranous ſack, which contains a warm bland water, and all the joints have their ligaments and cavities ſupplied with a mucilaginous fluid, to preſerve them in a flexible ſtate, and render their motions ſmooth and eaſy: But as this ſecretion is regular and conſtant, not only thoſe cavities, but the belly, breaſt, and others, would ſoon be too full, and the liquor

liquor would in time become rancid and acrimonious, if no means were provided to prevent ſuch effects. This is the duty of the lymphatic veſſels, which ariſing from thoſe different cavities, abſorb the ſuperfluous liquor, and tranſmit it to the blood, where it again ſerves another uſeful purpoſe; and ſo exquiſitely are the two powers balanced, that of the veſſels which lodge the fluid, with that of the veſſels which abſorb it, that in health, it neither ſtagnates nor overflows, but a juſt quantity of this lymph is kept up, not only in the joints and ſack that contains the heart, but in every cavity of the body where it is depoſited. This ſeems to be the great and conſtant office in which the lymphatic veſſels are employed during health; they alſo do eſſential ſervice in certain complaints, external as well as internal. They ſuck up the extravaſated blood which ſometimes is diffuſed below the ſkin, and in the interſtices

ſtices of muſcles, in conſequence of blows, bruiſes, or ſprains; without which, ſuch accidents would often be followed by more troubleſome conſequences than they are.

When the biliary ducts have been obſtructed, and the gall-bladder is ready to burſt, from the retention and accumulation of gall, the lymphatics are ſuppoſed, on ſome occaſions, to have prevented this fatal event, by abſorbing the obſtructed bile, and relaxing the tenſion of the gall-bladder, till, by the power of art or of nature, the obſtruction was removed.

They are occaſionally ſuppoſed to perform the ſame ſalutary office when other glands are obſtructed, and in other diſeaſed ſtates of the body.

A diſtinguiſhed anatomiſt of this country imagines it is by the means of the lymphatic veſſels that the body is conſtantly renewed, they taking up the old matter, while

while freſh ſupplies are conſtantly depoſited from the blood.

This idea he ſupports by many ingenious arguments and obſervations. He mixed madder with the food of a growing pig; it is known that this root taken inwardly tinges the bones of animals of a deep red colour; ſo ſtrongly are they imbued with this tint, that neither maceration in water or ſpirit of wine for weeks together, nor even boiling, is able to deprive them of it, or communicate the ſmalleſt tinge to thoſe liquors. But if the animal is allowed to live, and after eating the madder, is fed on its uſual food, after a certain time the red colour is gradually removed.

By feeding the animal alternately on this root and its uſual food during ſtated intervals, on killing the pig, he found alternate layers of red and white in the bones, correſponding in thickneſs to the length of the intervals during which the animal had eat or been deprived of the madder.

From

From this and other obſervations it is concluded, that the lymphatics abſorb and gradually carry off the hardeſt as well as the ſofteſt parts of our bodies, and are the inſtruments of the conſtant waſte, as the arteries are of the conſtant renewal, of animal bodies.

The lymphatics on the ſurface of the body are thought to be conſtantly abſorbing water from the atmoſphere.

Without this we could not account for the vaſt quantity of water found in the belly in dropſies; many gallons have in ſome caſes been collected within a few days, though the patient has not drank ſo many pints during that period.

While ſo many different uſes are found for the lacteals and lymphatic veſſels, it is remarkable, that all the ingenuity of phyſicians and anatomiſts has not only failed in aſcertaining the uſe of the glands through which

which they paſs; but has not been able to form one probable conjecture on the ſubject.

Indeed there ſeems to be an impropriety in calling thoſe ſubſtances by the name of glands; for whatever their office is, it muſt be very different from that aſcribed to all other glands, every one of which is ſuppoſed to ſeparate a fluid of ſome kind or other from the blood; at leaſt, blood is evidently and directly carried to all other glands, and a very different liquor flows out of their excretory ducts; whereas it is not blood, but chyle and lymph, which are carried to the meſenteric and lymphatic glands, and it is not a different, but the ſame fluid, apparently unchanged in any degree, that flows out of them.

When we perceive a liquor carried to any organ, and iſſue out of it quite altered in all its ſenſible qualities, we naturally conclude

clude that the organ contributes in ſome way or other to the alteration; but when the liquor ſeems to paſs through without undergoing any change, we are at a loſs to account for the organ's being placed in the courſe of the veſſels, or indeed for its exiſtence *.

Our perplexity is ſtill greater, with reſpect to the meſenteric and lymphatic glands; for we not only cannot perceive what uſe they are of, but we can plainly perceive, that on particular occaſions they are detrimental to health, as in the inſtances above mentioned, where their being affected in a particular manner, occaſions maraſ-

* Yet ſome very minute anatomiſts have aſſerted, that a white fluid is found in the cellular ſubſtance of the lymphatic glands of young animals, but not in thoſe of old: They add, that this fluid is globular, and of a courſe different from the lymph. It may be conjectured therefore, that the uſe of the glands is to ſeparate this fluid; but as this fluid, whatever is its uſe, makes no *apparent* change on the lymph, which iſſues out of the glands as pellucid as it entered, and as it is not found in old animals, the whole remains in as great obſcurity as before the diſcovery of the white whole fluid.

mus* and other complaints: This however is only a ſtrong inſtance of the limited nature of our faculties. The admirable mechaniſm of Nature in general, diſplayed in ten thouſand aſtoniſhing examples, and the exquiſite wiſdom with which every part is adapted to its peculiar uſe, in the human frame in particular, leaves us no room to doubt, that thoſe numerous glands ſerve ſome eſſential purpoſe, although this has hitherto eſcaped the reſearches of phyſiologiſts.

What confirms this idea, if a thing ſo obvious required confirmation, is, that in proportion as the ſpirit of ſcrutinizing nature has advanced among mankind, new proofs have appeared of the infinite intelligence of its Author in the arrangement of all its parts; and ſome have been diſcovered to be eſſential, which were formerly thought ſuperfluous.

* Maraſmus. A particular kind of conſumption.

VI.

RESPIRATION.

THE digeſtion of our food, the circulation of the blood, ſecretion, and abſorption, though all eſſential to life, yet are not ſufficient to preſerve it even a few minutes, without the conſtant flowing of freſh air into the lungs, and its reflux back to the atmoſphere. The firſt is called inſpiration, the ſecond expiration,—both reſpiration.

The thorax or cheſt in which the lungs are lodged, is compoſed of bones, cartilages, and muſcles, ſo artfully arranged, that its cavity may be conſiderably enlarged or diminiſhed at pleaſure. This is brought about, partly by the elevation of the ribs,

and partly by the pulling down of the diaphragm or muſcular partition, that divides the cheſt from the lower belly.

This partition naturally bulges convexly upwards, ſo as to encroach conſiderably on the cavity of the thorax; but on inſpiration, it is pulled downwards from its convex to nearly a plain ſurface, and thus gives a ſpace to the cheſt, which it takes from the lower belly.

The cavity of the cheſt therefore may be enlarged in two different directions,—by the elevation of the ribs it becomes wider, by the depreſſion of the diaphragm it becomes deeper.

The external air has acceſs to the lungs by the trachea or wind-pipe; the uppermoſt part of which, called the larynx, opens into the throat, by an aperture called the glottis, and communicates with the atmoſphere by the mouth and noſtrils.

The

The trachea is a flexible pipe, compoſed of a ſeries of cartilaginous rings, joined by muſcular fibres, and lined with a membrane.

This tube, deſcending from the throat into the lungs, divides and ramefies in company with the numerous branches of the pulmonary artery, and with them and the veins forms that ſpungy ſubſtance called the lungs.

The pulmonary artery terminates in the pulmonary vein; but the branches of the trachea end in ſmall membranous cells or bladders; ſo that there is not a *circulation* of air through the lungs, as there is of blood.

For the blood ruſhes in by one ſet of veſſels (arteries), and returns by another ſet of veſſels (veins); whereas the air, ruſhing in by the trachea, flowing through all its ramifications, and extending to its moſt remote cells, returns to the atmoſphere by the

ſame way it entered. The organs concerned in this are partly active, and partly paſſive. The intercoſtal muſcles and diaphragm are of the firſt kind, the lungs themſelves of the ſecond.

When the intercoſtal muſcles elevate the cheſt, which the croſs direction of their fibres, and the peculiar articulation of the ribs, admirably enable them to do; and when the diaphragm is drawn downwards, the cavity of the thorax is enlarged, and the air within the lungs expanded, in proportion to the acquired ſpace. This air, of courſe, becomes rarer and ſpecifically lighter than it was before.

But it was then in equilibrio with the atmoſphere; and this equilibrium being now removed by the expanſion, the external air enters the larynx, and flows through all the branches of the trachea, reſtoring the balance between the ambient air and that in the lungs.

Whether

Whether the cheſt is ſwelled by inſpiration, or depreſſed by expiration, the lungs fill exactly the whole cavity, and are always in contact with the pleura, which is the name of the membrane that lines the internal ſurface of the thorax; no air being permitted between this membrane and the external ſurface of the lungs, for if there was, the lungs could not poſſibly play, as this air would counterbalance the preſſure of the atmoſphere.

So many organs being ſubſervient to reſpiration, and this important function being performed by the means of ſuch curious and complicated mechaniſm, we need not be ſurpriſed to find that various attempts have been made to explain the immediate cauſe that excites this function. We are told of the compreſſion of certain nerves, the interruption of certain ſecretions, the ſtimulus given the lungs by the blood ruſhing into the pulmonary artery,

the alternate contraction of antagoniſt muſcles, thoſe of inſpiration relaxing thoſe of expiration, &c. &c.; but, after all, the matter remains unexplained to this day, unleſs what follows can be conſidered as an explanation; for when ſtripped of improbable conjecture, oſtentatious and technical terms, and ſuperfluous language, the volumes that have been written on the ſubject amount to this:

We have a ſenſation which excites us to expand our cheſt, the action accompanies the inclination, and the air flows into the lungs;—when enough is admitted to anſwer the purpoſes of health, we feel an equal deſire of expelling it, which is directly followed by the accompliſhment of our deſire; and thoſe alternate feelings are conſtantly renewed and gratified, with or without reflexion, aſleep as well as awake, while life laſts. A peaſant would have ſaid it in ſtill fewer words—"We breathe in conſequence "of its being in our power; and becauſe "pain

" pain and death would be the effect of our " not breathing."

Phyſiologiſts are not agreed with regard to all the uſes of the lungs, or the benefits reſulting to the body from breathing. Some of thoſe, however, are evident and undiſputed. No body can doubt that by their means the voice is modulated, the power of ſpeech is given to man, and, by the air entering the noſtrils and conveying effluvia, breathing becomes inſtrumental to the ſenſe of ſmelling. Other uſes have been aſſigned to this function, which, though they ſeem manifeſt to ſome, are not ſo univerſally admitted.

One opinion is, that, as the chyle is thrown into the blood a little before it circulates through the lungs, the great uſe of this circulation is to blend the two liquors intimately together, and complete the proceſs of ſanguification before the blood is diſperſed

diſperſed for the nouriſhment of every part of the body: Another opinion is, that the blood is attenuated in the lungs: Another, that it is condenſed there: And ſome think that the particles of blood receive their globular form there. Still another uſe imputed to the lungs, is to allow of the diſcharge of watery vapour in reſpiration, without which the blood, it is ſaid, could not retain its due denſity; and other inconveniencies would reſult. Others have imagined that the blood acquires its heat in the pulmonary artery; and that the action of the lungs contributes greatly to that uſeful purpoſe.

It is evident that heat muſt flow in every animal from ſome internal ſource; for the warmth of their bodies being uſually greater than that of the atmoſphere, they muſt lend heat to the air; but can borrow none from it. So, as there is a conſtant waſte, there muſt be a conſtant reproduction.

What

What that is, and where it originates, has long been, and ſtill is a matter of diſpute.

One opinion, as was above hinted, is, that the blood acquires its heat chiefly in the lungs.

That animal heat depends upon the action of the arteries, and the circulation of the blood in general, is very natural to imagine; becauſe, whatever increaſes the velocity of the circulation, whether exerciſe, friction, or diſeaſe, alſo increaſes the internal heat; whereas fainting, hemorrhage, and whatever produces a weak and languid circulation, alſo diminiſhes the heat of the body.

When a ligature is put around an artery ſo as to prevent the blood from being carried to any particular limb, that limb becomes colder than it was, and does not recover its natural heat, till by the expanſion of the lateral branches, which go off from the tied artery

artery above the ligature, the uſual quantity of blood is circulated through the limb.

Thoſe who believe that animal heat ariſes from the circulation, imagine it is immediately produced by the attrition of the particles of blood with each other, and with the ſides of the veſſels through which they flow; and as this attrition is greateſt in the circulation through the pulmonary artery, becauſe there the globules are not only rubbed by the action it has in common with other arteries, but alſo by the conſtant and peculiar action of the lungs, of courſe they conclude that animal heat is principally generated there.

This reaſoning would be irreſiſtible if the facts which ſupport it were not oppoſed by facts which have a contrary tendency. For, although the body cannot long retain heat without the circulation in general, and *that* through the lungs in particular, although the body acquires additional heat in proportion

tion to the force of the circulation, although the increaſed action of the whole body or of any part increaſes the heat, and although the attrition of ſolid bodies on each other never fails to generate heat; yet no attrition or agitation of fluids againſt ſolids, or of very ſmall particles of a ſolid plunged in a fluid againſt each other, has the ſame effect.

Take any quantity of blood out of the body, let it be agitated in the moſt violent manner for any length of time, yet neither the friction of the red particles againſt each other, or againſt the ſides of the veſſel, will produce the ſmalleſt heat.

To obviate the force of this very ſtrong objection, it has been obſerved that we cannot ſafely draw concluſions concerning the effects of any proceſs of the animal œconomy, from experiments made in imitation of them out of the body, the original being always ſo different from the copy; any

artificial agitation we can give to blood or other fluids out of the body, is ſo different from that of the circulation in it, that we ought not *poſitively* to conclude, from no heat being produced by the firſt, that none will be produced by the ſecond, eſpecially as we find that the exiſtence, increaſe, diminution, and abſence of animal heat, always accompanies the exiſtence, increaſe, diminution, and abſence of the blood's circulation.

The general import of this obſervation is juſt; yet as no friction or agitation of fluids againſt ſolids, however violent, not even the impetuous daſhing of torrents upon rocks, produces heat, we certainly have no argument from analogy that animal heat proceeds from the friction of the circulating fluids upon the ſolids.

The chemical commotion ariſing from fermentation indeed produces heat; but there is no evidence of any ſuch thing ever

taking place in the bodies of living animals. And even were we to adopt the opinion that ſome of the ſecreted fluids are formed in their ſecretory organs by fermentation, this could not account for animal heat; for its cauſe, be it what it will, cannot be occaſional or partial, but conſtant and univerſal, as the effect it produces; and it muſt alſo be reconcilable with this fact, that increaſing the force of the circulation, by whatever means, increaſes the heat.

There are fluids, however, which on being mixed generate heat without effervescence or any viſible commotion. This is the caſe on mixing ſpirit of vitriol and water, and in other inſtances; but whether any thing of the ſame nature can be ſuppoſed to take place in the body, or by the mixture of the different fluids of which the blood conſiſts, or whether it can be ſuppoſed to operate in conjunction with the action of the arteries and the lungs (which

ſeem

ſeem to be intimately connected at leaſt with the production of heat), I will not venture to determine.

An explanation of the manner in which animals acquire and retain heat, and from what ſources freſh ſupplies are conſtantly drawn, has been ſo often attempted that one would naturally imagine there was ſomething more curious and attracting in this than in inveſtigating any of the other cauſes of heat.

All the known ſources of heat are:

1. The ſun.
2. Burning fuel.
3. The attrition of ſolid bodies.
4. Fermentation.
5. The chymical union of bodies.
6. The bodies of living animals and vegetables.

And it is remarkable that every explanation of the latter is founded on a ſuppoſition that

that the heat is derived from ſome of the five preceding ſources.

We have already obſerved that it has been imputed to attrition and fermentation; of late it has been ſuggeſted (and the doctrine is ſupported with ingenuity) that the ſtomach is the principal ſeat of animal heat, and that it ariſes from the decompoſition of food *.

It was formerly hinted by another philoſopher, that a fluid fire is attracted by plants in their growth, and becomes conſolidated with their ſubſtance, which is the ſource of vegetable heat; and when the plants are decompoſed by fermentation, digeſtion, or otherwiſe, the fire recovers its fluidity and eſcapes.

Here then are three ſuppoſitions; fire is a fluid; plants have the property of attracting this fluid; and, in the third place, the

* Theory of the Production of Animal Heat, by Mr. Rigby.

power of conſolidating it. The three together form a maſs of difficulties, at leaſt as great as that they are intended to remove.

Indeed every attempt to explain the origin of animal or vegetable heat is open to this objection of being founded on ſome hypotheſis at leaſt as inexplicable as the phenomenon it ſhould explain.

I own I can ſee no excluſive title that animal heat has to the labour and ingenuity of phyſiologiſts; but if they chooſe to give a preference to it over the other ſources of heat, they ſhould found their hypotheſes on ſome other foundation than a ſuppoſed analogy with phenomena which are themſelves unexplained. It affords not a great deal more ſatisfaction to my mind to tell me that animal heat is owing to attrition, than it would to aſſure me that the warmth which accompanies attrition is owing to animal heat; for, in my apprehenſion, to endeavour to explain a thing of whoſe nature we are ignorant, by telling us it is like another thing,

thing, of whoſe nature we are equally ignorant, cannot make us a vaſt deal the wiſer.

It is Bays's anſwer to Smith, in the Rehearſal—

I am not acquainted with this Armarillis, ſays Mr. Smith, Pray, who is ſhe?

Armarillis, replied Bays, is ſiſter to Partheniſſa.

But unfortunately Partheniſſa had never before been heard of.

On the whole, as animal heat is evidently independent of the ſun's heat—for a living body always retains nearly the ſame degree of heat although placed in an atmoſphere much colder or hotter than itſelf, while a dead body, and all other matter, acquires the ſame degree of heat with the ſurrounding atmoſphere, and all explanations of animal heat, founded on its analogy with attrition, being in their nature unſatisfactory, I am afraid we muſt allow the bodies

of living animals and vegetables to form a ſixth original cauſe of heat, as much beyond our power of explaining as the ſource of the ſun's heat.

To return to our ſubject, from which we have deviated too far: However much reſpiration may be ſuppoſed to contribute to ſpeech, ſmelling, ſanguification, or even to the generation of heat, ſtill it will be difficult to account for the almoſt inſtantaneous extinction of life which follows a ſtoppage of breathing. From the uſes of the lungs, above enumerated, we perceive, indeed, that death muſt in a *certain time* be the conſequence of their ceaſing to act; but death's happening *ſo immediately* muſt depend on ſome other circumſtance.

It has been found that air cannot be retained many minutes within the lungs, nor can we long reſpire the ſame air, nor air which has ſerved the inflammation of fuel, without the moſt fatal conſequences.

Since therefore we cannot live without breathing, we either draw from the air ſomething ſalutary and eſſential to life, or elſe throw out of our bodies ſomething pernicious and deſtructive; but there is no evidence of our drawing any thing peculiarly ſalutary from the air, and there is evidence of our communicating ſomething highly pernicious to it. For the air is vitiated by breathing to ſuch a degree, that when a crowd of people are confined in any place where there is not a free ventilation, the air becomes abſolutely peſtilential, and acts as a mortal poiſon. And air which has been once reſpired is immediately ſo altered, that when it is collected, fuel or a burning candle cannot burn in it.

As the whole blood of the body, therefore, paſſes through the lungs, and is there brought almoſt into contact with the atmoſphere, we muſt conclude, that in the act of breathing the blood throws off that noxious quality which reſpired air acquires;

and that this is the principal purpoſe of reſpiration.

That ingenious and candid philoſopher, Dr. Prieſtley, has demonſtrated that the noxious matter thrown from the blood in breathing is phlogiſton *.

* Vide Philoſophical Tranſactions of the Royal Society of London, Vol. LXVI. p. 226.

VII.

THE NERVOUS SYSTEM.

THE human body is often called a machine by anatomiſts and medical writers; few of its powers however, or indeed of thoſe of any animal, can be explained on mechanical principles.

If the moſt acute writers have failed, when they applied that kind of reaſoning to the vaſcular ſyſtem, with which the mechanic powers and principles have ſome analogy, an attempt of the ſame nature on the nervous, with which they have none, would be abſurd.

The faculty of feeling, and the immediate and violent effects which particular

ſenſations have on the animal œconomy, muſt for ever diſtinguiſh its operations from thoſe of every work, however perfect, conſtructed upon the laws of mechaniſm.

The principles and powers of the latter we *underſtand*, and we know the effect to be produced. We *ſee* the effects of the former; but a knowledge of the principles and powers by which they are produced, has hitherto eluded human comprehenſion.

That part of the human body called the nervous ſyſtem conſiſts,

Firſt, of a large pulpy maſs, called the brain, which fills the cavity of the ſkull; and, in a man, is larger in proportion to the body, than in any other animal.

Secondly, of another white ſubſtance, proceeding from the former, paſſing through the baſis of the ſkull, and deſcending like a pulpy rope, within a long cylindrical cavity formed by the bones of the ſpine; this long white ſubſtance is called the ſpinal marrow.

Thirdly,

Thirdly, of maſſes of fibres or filaments, like white threads, detached from the brain and ſpinal marrow, to all the various parts of the body.

Anatomiſts generally reckon forty pair of nerves in all; ten of which ariſe from the brain,—the remaining thirty pair, from the ſpinal marrow.

The firſt are diſtributed to the organs of ſmelling, of hearing, of ſight, and of taſte, to the larynx* and thoſe parts ſubſervient to the voice and action of ſwallowing, to the head in general; and ſome of them ſend branches to the lungs and ſtomach.

Of the thirty pair of nerves which iſſue from the ſpinal marrow, ſeven go out between the vertebræ† of the neck,—twelve between thoſe of the back,—five from the

* Larynx. The upper part of the wind-pipe.

† Vertebræ. The chain of bones which deſcends from the baſis of the ſkull to the lower part of the loins.

loins,

loins, and fix from the falſe vertebræ, and are diſperſed over every part, external as well as internal, of the body.

Theſe forty pair ſpring directly from the brain or ſpinal marrow; but there is another pair of nerves, concerning which different opinions are entertained by anatomiſts; the moſt probable ſeems to be, that they come from the brain, in conjunction with the fifth and ſixth pair, deſcending along both ſides of the ſpine from the top to the bottom, and communicating in their courſe with all the nerves which come from the ſpinal marrow. They are called the intercoſtal nerves, and are ſuppoſed to be eminently inſtrumental in producing that univerſal ſympathy which prevails all over the body.

The nerves are enveloped as they iſſue from the ſkull and the vertebræ, in prolongations of the dura mater*, and then

* Dura mater. A membrane which lines the cavity of the ſkull, and covers the brain.

ſeem

ſeem pretty ſtrong inelaſtic cords; ſome people imagine they derive this ſtrength entirely from that membrane, being of themſelves ſoft and tender like the brain;—this however is not fully aſcertained.

The brain itſelf appears ſuch a groſs inert maſs of matter, that perhaps there is no organ of the human body that we ſhould have leſs ſuſpected of being connected with thought.

But although we can form no idea how this connection ſubſiſts, or by what means the nerves are the organs of ſenſation and motion, yet we cannot have any doubt of their being both.

The circumſtances which lead us to this opinion, and confirm us in it, are curious in themſelves; and a knowledge of them is uſeful in the practice of medicine.

We are led to conclude that the brain is the ſeat of thought,

Firſt, from a feeling we all have, that imagination, memory, judgment, and all the faculties of our minds, are exerciſed within the head; the cavity of which is completely filled with brain.

Secondly, Becauſe a long exertion of thought is as apt to create a head-ach, as an exceſſive exertion of the arms or legs is to produce uneaſineſs in thoſe members.

Thirdly, Becauſe the nerves, which ſerve four of our five ſenſes, the ſmell, the taſte, the ſight, and the hearing, take their origin *directly* from the brain; and thoſe which do not, take it *indirectly* by the intervention of the ſpinal marrow.

Fourthly, Becauſe whatever deſtroys the nerves belonging to any organ, effectually deprives us of the uſe of that organ. An obſtruction in the optic nerve, for example, produces complete blindneſs, although the viſible parts of the eyes remain perfectly ſound.

Fifthly,

Fifthly, Becauſe the cutting or tying a nerve, going to any particular limb, deſtroys all ſenſation and power of motion in the part below the ſection or ligature.

Sixthly, Becauſe a diſlocation of the vertebræ of the loins, by which the ſpinal marrow is compreſſed, numbs the ſenſation of the lower extremities, and renders them paralytic.

Seventhly, Becauſe cutting quite through the ſpinal marrow at the vertebræ of the neck, deſtroys all nervous communication between the head and the body; the vital motions of reſpiration, and the circulation of the blood muſt ceaſe, and of courſe the perſon dies*.

Finding that when the nerves going from the brain or ſpinal marrow, to any part of the body are deſtroyed, the ſenſation and

* It is evident, from the cauſe aſſigned above, that death muſt ſoon enſue,—but the perſon dies inſtantly, the reaſon of which is not ſo clear.

powers

powers of that part are alſo deſtroyed; we might naturally infer, that when the ſubſtance of the brain itſelf is injured, its functions would be impaired.

We accordingly find, that this in fact is the caſe, and that the functions of the brain are impaired in proportion to the injury.

A wound or diſeaſe, which eſſentially deſtroys the organization of the brain, immediately deſtroys thought and ſenſation, the perſon inſtantly dies.

Whatever confines or injures the brain, diſturbs thought.

A blow on the head has rendered a man of acuteneſs ſtupid during the remainder of his life.

A bad conformation of the ſkull, or ſome diſeaſe in the ſubſtance of the brain, are among the cauſes of ideotiſm.

The brains of madmen are generally found of an unnatural hardneſs or weight.

A ſmall

A ſmall preſſure of the brain diminiſhes, a ſtronger deſtroys the ſenſibility of the whole body.

When part of the ſkull has been beat in, ſo as to occaſion a compreſſion of the brain, without injuring it otherwiſe, the patient continues in a ſtate of drowſineſs or perfect inſenſibility; let the ſkull be raiſed by the ſurgeon's art, and the preſſure removed, the patient gradually awakes, as if from a deep ſleep, and regains the exerciſe of his underſtanding.

There was, ſome years ſince, a beggar at Paris, a conſiderable part of whoſe ſkull had been removed without injuring the brain, in conſequence of a wound. This being healed, he wore a plate upon the part where the ſkull was wanting, to prevent the brain from being hurt by every accidental touch.

For a ſmall piece of money this poor creature took off the plate, and allowed the brain to be gently preſſed, by laying a handkerchief,

kerchief, or ſome ſuch ſoft ſubſtance upon it; this immediately occaſioned dimneſs of ſight and drowſineſs; the preſſure being ſomewhat augmented, he became quite inſenſible with high breathing, and every ſymptom of a perſon in an apoplexy; from which ſtate he never failed ſoon to recover, upon the preſſure being removed. As this experiment was attended with no pain, it was often repeated, and always with the ſame effect.

From theſe obſervations it ſeems evident, that the brain is the ſeat of thought; and that a communication is kept up, by the intervention of the nerves, between this ſenſorium and all the parts of the body.

In preſerving this communication, the nerves perform two diſtinct offices.

One is, conveying ſenſation from all parts of the body to the brain: Whatever impreſſion is made, whether of an agreeable or diſ-

diſagreeable nature on any part of the body, immediate intelligence of it is conveyed by thoſe faithful centinels, to the ſeat of reaſon.

The other office performed by the nerves, is carrying the commands of the will from that ſeat to all the different parts of the body; in conſequence of which the limbs and body are moved, in a great variety of directions, as the will ordains. For *moſt* of the muſcles of the body which produce motion, are in the guidance of our will; ſome of them, however, are entirely independent of it, as thoſe of the heart and veſſels which carry on the circulation of the blood; and ſome are partly under the direction of our will, and partly independent of it, as thoſe of reſpiration.

But all muſcles, the involuntary as well as the voluntary, are enabled to act, only by their communication with the brain;

for when that is cut off by the deſtruction of the connecting nerve, whatever impreſſion is made on the part, can no longer be felt; the orders of the will to that part can no longer be obeyed, and the part itſelf can no longer move, or at leaſt it can move only for a ſhort time, by a power of a peculiar nature, belonging to muſcular fibres, which ſhall be mentioned more particularly hereafter.

As nerves are diſperſed to almoſt every part of the body, almoſt every part of the body is endowed with feeling, but in very different proportions; ſome parts having a much more delicate ſenſation than others.

The bones, cartilages, ligaments, and tendons, in a ſound ſtate, ſeem inſenſible.—Nerves have been traced into bones; I believe none have yet been diſcovered going directly into the cartilages, ligaments, or tendons.

We

We have no doubt, however, of theſe being furniſhed with them alſo, becauſe in particular ſituations they have ſenſibility.

The bones and other parts of little or no ſenſibility when in a ſound ſtate, are ſubject to very acute and permanent pain in a ſtate of inflammation: We know this by the effects of the venereal diſeaſe, of the rheumatiſm, and of the gout.

A prodigious quantity of nervous filaments is diſperſed to the ſkin, and minutely interwoven with its ſubſtance; the feeling of this tegument therefore is exquiſite, and were it not covered and blunted by the inſenſible cuticle or ſkarf ſkin, the commoneſt actions of our lives would be inſupportable; but having this thin and inſenſible membrane admirably ſpread over every part of it, the clothes and other ſubſtances which neceſſarily come in contact with the body, give no pain, and many feelings are

rendered indifferent or pleaſing, which otherwiſe would have been agonizing.

The only parts of the body that ſeem to be entirely and in every ſtate inſenſible, are the hair, the nails, the ſkarf ſkin, and perhaps the enamel of the teeth.

As the firſt two often require to be cut, it would have been unfortunate for mankind if they had been endowed with feeling.

The perfect inſenſibility of the cuticle protects us from the torture which every movement of the body would otherwiſe have occaſioned, while its thinneſs permits that degree of ſenſation that is neceſſary for warning us to avoid the ſhock of deſtructive ſubſtances; and in a thouſand inſtances conduces to our ſafety, our eaſe, and our pleaſure.

The enamel, in ſome meaſure, performs the ſame good office to the ſofter bony part of the teeth, that the cuticle does to the ſkin;

ſkin; the wiſdom and benevolence of the Author of Nature being equally conſpicuous in the formation of thoſe parts, which are deprived of all feeling, as in thoſe which convey the moſt agreeable ſenſations.

It has been already obſerved, that four of our five ſenſes are confined to the head; each of theſe four have organs exquiſitely formed for their uſes, with proper receptacles adapted to their nature, contrived for their convenience and protection; and there alone their functions are exerciſed. The fifth ſenſe, that of feeling, belongs to the whole body, but is moſt accurately exerciſed by the hands.

Many of the brute creation enjoy the organs of the ſenſes in common with man, and poſſeſs ſome of the ſenſes, particularly that of ſmelling, in greater perfection than any of the human race; but the touch they certainly have in a far inferior degree: For

beſides the more perfect ſenſation that man muſt have all over the body, from the delicacy of the ſkarf ſkin; the make and ſenſibility of his hands render his touch infinitely more accurate than that of any animal. There is certainly nothing in the external form of man, which gives him ſo many advantages over other animals, as the admirable mechaniſm of his hands.

It has been remarked, that even brutes are intelligent in proportion to the accuracy of their feeling, or as their extremities approach in reſemblance to the human hand. The horſe and the bull, whoſe feet are covered with callous hoofs, are leſs intelligent than the dog, and the dog is inferior in acuteneſs to the ape, who has a rude kind of hand.

Independent of other more important advantages, the ſuperiority which the wonderful contrivance of this member gives to man,

man, is prodigious: By the variety of its motion in all directions; by its diviſion into fingers, and by their flexibility, it is enabled to ply round every ſubſtance; by the exactneſs of its touch, to convey a juſt notion of every form; by its ſtrength, it enables man to rear fabrics to conveniency, to magnificence, and to devotion; by its dexterity, to imprint upon ſtone and upon canvas, the moſt beautiful imitations of nature, and the ſublime conceptions of genius; and by its united powers, to form and wield weapons more formidable than the paw of the lion, or the proboſcis of the elephant.

It cannot be denied, however, that with the external ſenſes, many of the brute creation are endowed, in common with man, with ſeveral faculties of a more refined nature. Some people, whether from a high opinion of other animals, or a humble one of human nature, I ſhall not take upon me to ſay, have ſtruggled hard to bring the one

as near to the other as they could, or put them quite upon a level, if poſſible.

By thoſe advocates for the brute creation we are told, that they are actuated by the paſſions of fear, of grief, of joy, of anger, and of jealouſy, as well as men; that they poſſeſs the virtues of fidelity and gratitude in a higher degree.

That the greateſt heroes have not ſurpaſſed them in courage; that they even diſplay that quality, independent of any advantage to be acquired, and from no apparent motive, but a generous ſpirit of emulation, and a diſdain of turning their backs upon danger.

That they affectionately tend, and carefully provide for their young; and with a prudent attention to their own future welfare, they prepare for the ſcarcity of winter, by carefully heaping up proviſions during the abundance of ſummer.

That

That to avoid the inconveniencies and ſeverity of northern winters, they croſs vaſt deſerts and ſeas in ſearch of more genial climes; and prompted by a predilection, a patriotic attachment, they return at the approach of ſummer to their native country.

That they uniformly follow that plan of life which is moſt ſuitable to their reſpective natures, and never, miſled by vain hopes and fantaſtic deſires, deviate, like man, into the paths which lead to miſery and remorſe.

That they are not obliged, as men are, to ſearch after remedies for their diſtempers, by dangerous trials and laborious experience, nor to truſt the care of their healths to a combination of ſelfiſh mercenaries; but when by accident they are ſick, which is ſeldom the caſe, they find their cure at once, by an intuitive faculty, without any trouble.

After having admitted, in its fulleſt extent, every fair compariſon that can be made between man and the moſt perfect of the other animals, acknowledging that both have bodies of matter organized in many reſpects alike; that the bodies of both are made up of bones, muſcles, and blood-veſſels, organs of reſpiration, circulation, and digeſtion; that both have brain and nerves apparently of the ſame ſubſtance and texture; that in both, thoſe are the organs of will, of ſenſation, and of motion; that both poſſeſs five ſenſes of the ſame nature, and have a reſemblance in many of their appetites and inclinations; after all thoſe conceſſions, the internal faculties of the moſt intelligent of the brute creation will be found, upon a juſt eſtimation, at a prodigious diſtance beneath thoſe of men.

The actions of the one ſeeming to proceed from the impulſe of ſome want, the incitement of ſome appetite, or ſome con-

trolling ſpring within them, which obliges them to perform the ſame thing in the ſame manner; all their boaſted works, the labours of every ſpecies, and of every individual of the ſpecies, are as uniform as if they had been all caſt in the ſame mould. This appears in their neſts, in their cells, in the labours of the ant, the bee, and the beaver; all their works are formed by an invariable accumulation, a neceſſary attraction and depoſition of matter, like the growing of a plant or the cryſtallization of a ſalt.

One race of the moſt intelligent ſpecies never improves upon a former, nor one individual upon another. At the end of the elephant's long life, what does he know that he did not know at the beginning? What does the young elephant learn from the experience of his father?

There is no æra of greater brightneſs than another in the hiſtory of any animal but

man;

man; all, from the earlieſt records of time to the preſent moment, is one uniform period of far greater darkneſs than any recorded in the annals of mankind.

And if it is urged that there may have been ſome unrecorded æra of human ſociety wherein men were in a ſtate of equal darkneſs, it muſt be allowed that they have emerged out of it, which equally proves the great ſuperiority of their nature.

Speech, that wonderful faculty by which men convey to each other every emotion of their heart and every idea of their mind, is natural to all the human race, even to the moſt uncultivated negro and ſavage, but is unknown to the wiſeſt of all other animals. Is this owing to a defect in the organs of ſpeech? No. In ſome animals thoſe organs ſeem ſufficiently capable of it, and ſome have been taught to pronounce ſentences, but none to underſtand what they pronounced; for language implies a chain of connected

connected ideas ſuperior to what any animal but man ſeems able to attain.

How comes it, that with ſo much ſagacity and reflexion as ſome people contend certain animals poſſeſs, the ſtrongeſt and the ſhrewdeſt among them have not made the weaker and leſs intelligent ſubſervient to their uſe? How comes it, that the moſt uncultivated of the human ſpecies have from the beginning of time made the moſt powerful and knowing of the brute creation ſubſervient to theirs? If by his external form man has ſome advantages over them, by forming an alliance they might ſoon overbalance this, and free themſelves from ſubjection. What human force could ſtand againſt an allied army of lions, elephants, and eagles, if they had judgment to uſe their ſuperior powers?

Even attention to their young, the moſt univerſal and moſt amiable part of the character

character of irrational animals, ſeems independent of ſentiment and reflection, and to proceed from the blind impulſe which prompts them to the choice of plants in ſickneſs, to accumulate proviſions, and build cells; for after a ſhort period thoſe young are entirely neglected, and no trace of affection, or the ſmalleſt tender recollection, ſeems any longer to ſubſiſt between the parent and the child.

How different is this from the ſenſations of the human ſpecies, where the father and mother feel their youth reſtored, and their exiſtence multiplied in their children, whom they endeavour to turn from the allurements of folly, and by creating in their minds a deſire of knowledge and uſeful attainments, they ſave from the wretchedneſs of vacancy, and the contempt attendant upon ignorance; who encourage their exertions, ſupport them under diſappointment, whoſe chief

chief happineſs depends on the proſperity of their offspring, and who feel the approach of age without ſadneſs, while the evening of their lives is brightened by the riſing reputation of their children.

Notwithſtanding the analogy which has been pointed out in the ſtructure of animals, which is thought to be continued by a gradual and almoſt unbroken chain of connection from man down to the moſt inſenſible of the animal world, and from thence carried equally entire through the vegetable, this analogy is in the bodily ſtructure only; for when we turn our reflections to the reaſoning faculties of man, and the endowments of the human ſoul, the diſtance between this and the higheſt intelligence of any other animal is infinite.

The only advantage that other animals can be ſuppoſed to have over man is, that being excluded by their nature from all

mental

mental enjoyments, they are alſo ſecured from all the pains and diſquietudes that proceed from the ſame ſource; but to acquire an exemption from diſquietude at the expence of being equally exempted from all the delicate feelings of the mind and affections of the heart, is a purchaſe which I hope no honeſt mind will ever be willing to make. An ingenious lady, in a celebrated * Ode, ſeems, however, deſirous of the exchange; but the moſt ſcrupulous obſervers of truth on other occaſions, are permitted to be inſincere in poetry. If this indulgence is granted in proportion to the poetic talent diſplayed, few people have a right to ſo great a ſhare as this lady.

It was obſerved above, that as often as an impreſſion is made upon any part of the body, a ſenſation proportionable to the force of the impreſſion and to the ſenſibility of the part is inſtantly carried by the nerves to

* Ode to Indifference, by Mrs. Greville.

the brain, and our attention is directly called to the part affected.

But it sometimes happens that when the impression is really made upon one part, the sensation is perceived as if it were altogether, or in the greatest degree, in another, at perhaps a considerable distance.

Thus an affection of the liver often occasions a pain in the right shoulder.

This circumstance of one part feeling when another is injured, being similar to the concern which a person of humanity takes in the distresses of his fellow-creatures, has procured it the name of sympathy.

There are some particular impressions which occasion an almost universal sympathy all over the body.

Cold water thrown upon a warm part of the body produces a sudden contraction of all the external fibres.

Tickling the soles of the feet will throw almost the whole muscles of the body of many people into convulsions.

A glaſs of wine or of brandy received into the ſtomach of a perſon exhauſted with fatigue and ready to faint, gives inſtantaneous ſpirits and freſh vigour: This muſt proceed from the manner it affects the nerves of the ſtomach, and their being ſympathiſed with, by the reſt of the body, as there is not time for the liquor being conveyed into the blood in the uſual manner.

When a fever ariſes in conſequence of a wound, or of any local affection, it muſt be owing to the ſympathy between the part affected and the conſtitution in general.

There are certain parts of ſo much importance to life that they cannot be affected, even in a moderate degree, without occaſioning a general ſympathy, or in other words, diſturbing the whole conſtitution; ſuch are, the brain, ſtomach, and vital organs.

But even the leaſt important parts of the body endowed with ſenſibility, when they

are

are violently affected, produce alſo univerſal ſympathy: Thus a ſevere toothach occaſions a conſiderable degree of fever.

Worms irritating the nerves of the inteſtines ſometimes occaſion fever, ſometimes convulſions, and often itching in the noſtrils.

The teething of infants often produces purging and fever, and ſometimes convulſions.

Beſides the general ſympathy of the conſtitution with certain parts of the body, there are alſo many particular ſympathies between two particular parts.

A diſeaſe of the liver producing pain in the right ſhoulder has been already mentioned.

Any thing irritating the kidneys, ſand for example paſſing from thence to the bladder, occaſions a vomiting.

A rough ſtone in the bladder produces a pain at the end of the urethra.

The ſtomach not only is more univerſally ſympathiſed with than other organs, but alſo has a greater number of diſtinct reciprocal ſympathies with particular parts of the body, than any other organ.

A blow on the head occaſions vomiting.

A diſordered ſtomach often excites a headach. The headach which is apt to come after drinking too much wine or other ſtrong liquors, certainly proceeds from the ſtomach, and ſometimes is diminiſhed or entirely removed by a dram.

The tremor or ſhaking in the hands to which habitual drunkards are ſubject, is palliated by the ſame inſidious remedy.

A diſordered ſtomach with indigeſtion, is often accompanied with fluſhings in the face, with palpitations at the heart, with intermitting pulſe, with difficult breathing, with dejection of ſpirits, with an uncommon ſenſibility to any unexpected ſight or noiſe, and with giddineſs.

The

The ſight or ſmell of grateful food produces an augmented flow of ſaliva.

Whatever produces a naufea has the ſame effect.

A draught of very cold water, or eating iced creams, gives a pain in the noſe near the forehead. Harſh ſounds affect the teeth.

Eunuchs have no beards; and their voices are different from thoſe of other men: This ſhews a ſympathy between remote parts, which no anatomiſts could have ſuſpected, from communication of nerves or otherwiſe.

A mutual ſympathy is obſervable not only between different parts of the ſame body, but our bodies are alſo affected by the impreſſion which various things unconnected with them make upon our minds.

Some people faint at the ſight of blood, even when it is made to flow from the vein of another, on account of his health.

Others complain of an uneaſy ſenſation in their own eyes, on looking ſtedfaſtly at the inflamed eyes of another perſon.

Every ſentiment of the mind has particular parts of the body in correſpondence with it, and affected by it.

A ridiculous ſcene paſſing before the eyes, or even recounted to us, throws us into a convulſion of laughter.

In the ſame manner an affecting ſcene, or an affecting ſtory, excite the function of the lachrymal glands, and we ſhed tears.

Any inſtance of great oppreſſion or injuſtice which we ſee or hear of, produces inſtant marks of indignation in our countenances.

If we ourſelves are the objects of injuſtice or inſults, anger and rage will be very apparent in the muſcles of our face.

A ſolemn or awful ſcene naturally compoſes the countenances of the ſpectators into an uniform ſolemnity of features.

Hatred, ſcorn, love, ſuſpicion, confidence, admiration, and every other paſſion or emotion of the mind, have particular muſcles in ſympathy with them, and affect the features in a particular manner. So that in remote villages, and in thoſe countries where the emotions of the heart are not attempted to be concealed or diſguiſed, it is an eaſy matter to know the ſtate of men's minds by looking in their faces. But in more artificial ſociety, in great cities and in courts, where many are ſtruggling for the ſame object, where there is an everlaſting rivalſhip and jarring of intereſt, where men are anxious to conceal their deſigns and their wiſhes, and dare not avow the real motives of their actions, it is difficult to judge of the feelings of the heart by what appears in the countenance; yet in the midſt of all this affectation and diſguiſe, men of experience and penetration will often ſee real joy through artificial tears, genuine ſadneſs in aſſumed gaiety, and in-

veterate hatred lurking under all the officious ſmiling diſplay of kindneſs.

Art cannot long carry on a ſucceſsful war with nature; men cannot be always on their guard, or keep their features in everlaſting conſtraint; the genuine paſſion will occaſionally ſhew itſelf in the countenance by the ſympathiſing muſcles; the hypocrite is that inſtant detected, and all his future grimaces are in vain. Theſe laſt examples are the natural expreſſions of the paſſions, and perhaps cannot with ſtrict propriety be given as inſtances of ſympathy.

But, independent of the paſſions and affections of our own minds, the mere expreſſions of them in the features of others is apt to produce an imitation of theſe expreſſions in our own features.

There ſeems to be ſuch a degree of ſenſibility or ſympathy in the muſcles of the human face, that they ſpontaneouſly give an expreſſion correſpondent with what we behold

hold in the features of another perſon, even although we are ignorant of the cauſe which excites it. One perſon yawning will prompt others to yawn almoſt as effectually as a long piece of good advice or a dull ſtory.

At the accidental ſight of people in grief or joy, though we are perfect ſtrangers to them, know nothing of the cauſe of their emotion, and are not at that moment in the ſame circle with them; our features, inſenſibly as we look at them, aſſume the appearance of grief or joy, provided we have no particular reaſon to controul them.

I have ſeen one electric glance from Mrs. Siddons transfer horror into the faces of a whole audience, even of thoſe who had juſt arrived, and were in no degree previouſly affected by the *cunning of the ſcene.*

Affections of the mind not only produce tranſient expreſſions of ſympathy in the features of the countenance; but when they

they are exceſſive, or when the conſtitution of the perſon affected is weakly, they have been known to ſtop the ſprings of life altogether, or ſubject the conſtitution to ſome permanent diſeaſe.

The unexpected ſight of an object of horror is one of the cauſes of epilepſy, and is ſaid to be particularly apt to prove ſo, when the horror is raiſed by ſeeing a perſon under the convulſive contortions of this diſeaſe.

That all ſympathies between different parts of the body are owing to the nerves, is in the higheſt degree probable; but how they are carried on, we have no clear idea; it is in vain to attempt to account for it by he communication of the nerves with each other, or by any nervous communication between the ſympathiſing organs; for each nervous filament is diſtinct from all the reſt the whole way from its origin to its termination;

nation; and there is a ſtriking ſympathy between many parts, which have no communication by means of nerves with each other, as in the inſtance above mentioned of eunuchs.

Beſides, when we do trace a communication by nerves between any organ and a part with which it ſympathiſes, we cannot impute the ſympathy to this communication; becauſe we ſometimes find that the ſame organ has an equal communication by nerves with ſome other parts with which it has no ſympathy.

As it is evident therefore, that various affections of the mind, excited by external objects, produce extraordinary motions, and other effects on the body, merely by affecting the brain; and as the conſent and ſympathy between different parts inſtantly ceaſe, when their communication with the nerves is interrupted, it ſeems natural to conclude,

conclude, that all ſympathy takes place through the intervention of the brain.

What happens in the epilepſy or falling ſickneſs, will contribute to illuſtrate and confirm this opinion. In the epilepſy the fit begins by the perſon's falling down in a ſtate of complete inſenſibility, and immediately after, his whole muſcular ſyſtem is agitated with violent convulſions, the muſcles of the face and eyes in particular being frightfully moved and diſtorted, the tongue is ſometimes thruſt between the teeth, and if care is not taken to guard againſt it, it will be bit through by the convulſive ſhutting of the jaws.

The cauſe of this diſeaſe is an affection of the brain of ſome kind or other. It may happen by the direct ſtimulus of an inſtrument, ſplinter, or other extraneous ſubſtance; by whatever impels the blood with violence, and in unuſual quantity to the brain;

brain; as a fit of anger, intoxication, violent exercise in a warm sun; it may also be occasioned, as has been already remarked, by a sudden fright, the unexpected sight of an object of horror; particularly that of a person under a fit of the same disease. In the cases above enumerated, the brain itself is directly and immediately attacked, whether the irritating cause be mental or corporeal; but the disease is also produced by stimulants, which act immediately and directly upon some distant part, and the impression is transferred to the brain by the nerves, as in the instances of the teething of infants, of worms, or something acrimonious in the alimentary canal, calculi* in the kidneys, and finally, by what is called the *aura epileptica*.

This is a sensation which some epileptics have, previous to every fit: some describe it

* Stones.

like

like a current of freſh air flowing ſlowly, others like an inſect moving or creeping upwards from the extremities or lower parts of the body to the head, where it no ſooner arrives than the patient becomes inſenſible, and falls into an epileptic fit.

But none of thoſe irritating cauſes which begin by an attack elſewhere, and not upon the brain, are ever found to produce a pain, convulſive motion, or affection of any kind in any of thoſe parts with which they have a communication by the nerves; and may be ſuppoſed to have a ſympathy, until the ſtimulus has, in the firſt place, been conveyed to the ſenſorium or brain.

This appears evident, becauſe the patient becomes inſenſible in the firſt place, and the convulſions happen afterwards: Whereas if there was a ſympathy between the different parts by means of the nerves independent of the brain, we ſhould certainly ſometimes ſee convulſions in the ſtimulated parts themſelves,

themſelves, and in thoſe with which they ſympathiſe, previous to the brain's being affected.

The firſt ſenſation of the *aura epileptica* is generally felt at one particular point; ſometimes a tumour or ſome other external mark of diſorder indicates the place; but at other times we can perceive nothing of that nature, and ſo far from affecting any other part with which it may have a nervous communication by ſympathy, we ſometimes can only preſume there is ſome diſorder in that part, from the circumſtance of the *aura*'s beginning there.

It ſeems very remarkable, that the diſeaſe may be radically cured by cutting out, or otherwiſe deſtroying the part; when this cannot be ſafely done, or is not ſubmitted to, the fit may be prevented by a ligature applied above the part where the *aura* ariſes.

And

And when that dreadful diſeaſe, the tetanus or locked-jaw, ariſes, from the injuring a nerve by puncture or any external violence, although the diſeaſe ſhould not appear for many days after the injury is received, and when the wound ſeems almoſt healed up; yet even then, the moſt effectual means of preventing impending death, is, by entirely amputating the part, or at leaſt cutting through the nerves belonging to it, and ſo deſtroying its communication with the brain or ſpinal marrow.

But there is a power of a peculiar kind belonging to muſcular fibres, by which they are enabled to move and contract themſelves for ſome time, independent of the will, of their communication with the brain, and of life itſelf. For after the nerve which ſolely ſupplies a muſcle, has been tied, entirely cut through, or otherwiſe deſtroyed, ſtill the muſcular fibres may be excited to contractions, by a ſharp in-

ſtrument, or the touch of ſome acrimonious ſubſtance. Even after the animal is dead, or when a muſcular part is cut from the body, this contractile power continues for ſome time in the muſcular fibres; it remains much longer in ſome animals than in others; and in all animals is more apparent, and remains longer in the heart, than in any other part.

If the nerve going to a muſcle be irritated, the muſcle contracts, but not the nerve; yet this irritability is not in proportion to ſenſibility; for the heart, which is the moſt irritable part of the body, is far from being the moſt ſenſible. Muſcles upon being irritated, generally contract and relax alternately ſeveral times; the contractile force diminiſhing each time till it ceaſes entirely.

The phenomena of irritability are undiſputed; but phyſiologiſts are not agreed reſpecting the cauſe. The moſt prevalent

opinion is, that this property is inherent in the muſcular fibres, totally independent of the nerves, becauſe it exiſts after the communication with the brain is cut off. But this does not appear to me a ſatisfactory proof; becauſe although it unqueſtionably does exiſt in the muſcular fibres, after their communication with the brain is deſtroyed, yet it exiſts but for a ſhort time; the nerve ſtill remains in the muſcle, and it is very poſſible that the contractile power is entirely derived from the nervous influence received from the brain, before the communication was interrupted, and which continues to operate for ſome time after. We know that every part of the body is kept alive by means of the circulation of the blood; but if the circulation is ſtopped for a few minutes in any particular member, that member will not immediately mortify. Animals will live a conſiderable time without freſh ſupplies of nouriſhment; but we would

would not conclude from thence, that animals are not kept alive by food.

It ill accords with the beautiful ſimplicity of Nature, to make uſe of two cauſes, when one is ſufficient to produce an effect. Since, therefore, it is evident, that muſcles are empowered to move and contract by the means of nerves and the communication with the brain, why impute this irritability to a new cauſe, when it is equally accounted for by ſuppoſing, that the nervous influence remains in the muſcular fibres for ſome time after the communication is interrupted?

The ſum then of our knowledge of the nervous ſyſtem is, that the brain is the ſeat of thought, and origin of all ſenſation and motion; that every ſenſation is conveyed thither, every idea formed there, and the power of every motion proceeds from thence through the nerves to the muſcular parts of the body.

We know that the will can produce motion in certain parts of the body, and not in others; that the nerves are the immediate inſtruments of feeling and motion; that all ſenſibility and motion, except that particular kind proceeding from irritation, depend upon the intercourſe between the moving part and the brain, by the nerves being entire; that a general ſympathy, by means of the nerves, prevails over the whole body; and that there is alſo a particular ſympathy between particular parts.

But by what means, or in what manner thoſe things are brought about, we have not the ſmalleſt conception. Phyſiologiſts have ſtruggled hard to account for ſome of them; but in my mind they have left the matter much as they found it.

Some have ſuppoſed that the brain conveyed its influence along the nerves by vibration.

The

The Latin word *nervus*, which ſignifies both the ſinew of an animal, and the ſtring of a muſical inſtrument, which excites ſound by vibration, probably led to this idea; for in other reſpects, nothing can be leſs analogous to a tenſe elaſtic muſical chord, than looſe nervous filaments, generally immerſed in a cellular membrane, unelaſtic and incapable of tremulous motion.

Beſides, the nerves convey ſenſation when they are relaxed, by bending the arm or leg, as well as when they are ſtretched by extending the limbs.

It has been maintained by others, that the brain is of the nature of a gland, and ſecretes from the pureſt part of the blood a refined fluid called animal ſpirits; and that the nerves are excretory ducts, through which this fluid iſſues, at the command of the will, for all the purpoſes of life; that this fluid is gradually exhauſted by the labour of the body and mind, while we are

awake, but during ſleep a freſh ſupply is ſecreted for the occaſions of our waking hours.

It is unfortunate for this hypotheſis, that this refined fluid happens to be ſo very refined as to baffle the power of our ſight, and of all the optical auxiliaries we can bring to its aſſiſtance. The cavities of the nerves, which are ſuppoſed to contain this fluid, labour under the ſame misfortune.

If the doctrine however were well ſupported in other reſpects, thoſe objections might be gotten over, for in many inſtances we have a complete evidence of the exiſtence of things not ſeen; to mention only one, we can, by the help of microſcopes, ſee, and but juſt ſee, certain animalcules; and we are fully convinced that thoſe animalcules are organized, and have veſſels which we cannot ſee.

With

With regard to the animal ſpirits being exhauſted by the labour of the mind and body, and freſh ſupplies accumulated during ſleep, this may be thought liable to a ſtronger objection, in as much as we ſee ſo many people who ſleep a great deal, and uſe neither bodily nor mental labour while awake, and yet ſeem not poſſeſſed of more animal ſpirits, or any other kind of ſpirits, than their neighbours.

It is certain however, that the nervous powers are exhauſted when awake, and reſtored during ſleep; but it is equally certain, that Nature requires only a competent ſhare of ſleep, as of food, to reſtore her exhauſted powers, and more than that of either has a debilitating, not a ſtrengthening effect.

Some phyſiologiſts, who ſeem in other particulars well enough ſatisfied with this ſyſtem, heſitated when they reflected on the

rapidity with which the will is obeyed by the moving muſcles, which ſeems incompatible with the nature of any liquid; and therefore they thought proper to convert the animal ſpirits into a kind of elaſtic vapour, ſecreted by the brain, which they imagined might move through the nerves with the facility and quickneſs of thought, and enable them to perform their duty in a more ſatisfactory manner.

Others dropping the idea of the brain's being an organ of ſecretion, or that the animal ſpirits are drawn at all out of the blood, inform us, that there is a certain *elaſtic æther*, of infinite ſubtility, which pervades all Nature: That this æther, when it meets with glaſs, roſin, and ſome other ſubſtances, and is put in motion in a particular manner, produces all the phenomena of electricity; united with iron it is the cauſe of magnetiſm, and being modified in the brain and nerves by an organization which we

we cannot conceive, becomes the agent of their powers.

The electrical ſparks which iſſue from the bodies of certain animals on friction; the ſalutary effects of electricity in ſundry diſeaſes, particularly in paralytic complaints, and ſuch wherein the nerves are chiefly affected, are brought in ſupport of this doctrine, which is ſuppoſed to receive additional force from certain late obſervations relative to the ſhock, like the electrical ſhock, communicated by the touch of certain animals.

Soft pulpy ſubſtances, as the brain, ſpinal marrow, and inelaſtic cords like the nerves, ſeem however ill calculated for retaining or conveying ſuch an active fluid as that of electricity; and if they had ſuch a power, it would be ſtill difficult to conceive that a compreſs or ligature upon a nerve could ſtop a fluid of ſuch ſubtility.

But

But if it were as eaſy a taſk to give a ſatisfactory explanation of this abſtruſe matter, as it is to ſtart objections to every ſyſtem hitherto ſuggeſted, the means by which the brain acquires its powers, and the manner in which it conveys its influence to the remote parts of the body, would have been explained long ago.

I have juſt hinted the different opinions that have been entertained on this ſubject. They are detailed at a tedious length by various authors, and inſiſted upon with more zeal than they ſeem to merit. For even admitting the truth of any of the above hypotheſes, they could be applied to no practical uſe; none of them are founded on experiment, and all of them fail in throwing any light on the ſubject which it is pretended they explain. The ridicule thrown by the ſupporter of any one of thoſe conjectures upon all the others, may with equal ſtrength be retorted on his own; for

for it is as difficult to underſtand how ſecreted fluids or elaſtic æther can convey the ſenſe of ſmelling, &c. as that ſolid cords ſhould do it. And whether the nerves are ſolid cords operated on by vibration, or hollow tubes containing a ſecreted liquid, or ſubſtances which attract a ſubtile æther, of the nature of the electric fluid, ſtill we ſhould be in the dark how the will commands various movements of the body; how having the command of ſome parts, it has not that of others, which are equally ſupplied with nerves; how certain parts are capable of ſenſation *only* when they are in a morbid ſtate; how nerves, apparently of the ſame ſtructure and nature, convey ſuch different ſenſations. The ſound of muſical inſtruments affects not in the ſmalleſt degree the optic nerves, while it delights the auditory; and the effluvia of a roſe, ſo agreeable to the olfactory nerves, gives no kind of ſenſation to the two former.

We

We know in general, that certain paſſions of the mind produce particular effects on the body; but by what means they produce them, nobody has as yet been able to explain. And that paſſions, the moſt oppoſite and diſſimilar, ſhould in ſome inſtances produce the ſame effect, ſeems equally unaccountable. Who could expect, for example, the ſame redneſs of the face from the delicacy of modeſty, that is produced by the violence of rage?

That the palpitation of the heart, and paleneſs of the face, occaſioned by fear, immediately proceeds from a contraction of the veſſels, and from the blood being thereby ſtopped in its courſe, and thrown back on the heart, we naturally conjecture; but how that paſſion does produce the contraction, we cannot comprehend.

And all the theories hitherto invented, leave us equally ignorant how to account for or remedy a diſeaſe, ſaid to be more frequent

frequent in this iſland than elſewhere; and which certainly depends on ſome affection of the origin of all the nerves, although from certain ſymptoms, with which it is ſometimes accompanied, it derives its name from another part of the body*.

In this melancholy complaint, the patient, when apparently in good health, and perhaps in the moſt opulent and deſirable circumſtances, is gradually invaded by a languor and dejection of ſpirits, which render him averſe to every kind of exertion of body or mind, regardleſs of things of the greateſt importance, and which formerly intereſted him the moſt.—But he becomes infinitely attentive to a thouſand trifles which he uſed to diſregard, and is particularly watchful of every bodily feeling, the moſt tranſient of which he often

* Hypochondriaſis, a diſeaſe ſo called from its ſeat being ſuppoſed to be in a part of the belly which phyſicians call the hypochondriac region.

conſiders

conſiders as the harbinger of diſeaſe; and viewing objects through the medium which overclouds his own imagination, every thing appears to him dark and diſmal. He is always apprehenſive of the worſt; and conſiders the moſt indifferent and even the moſt fortunate incident as the omen of ſome impending evil. Although in his brighter days he may have been a man of courage, he becomes prepoſterouſly afraid of death, now when he ſeems to have loſt all reliſh for the enjoyments of life.

Entirely occupied by his own uneaſy thoughts and feelings, all other ſubjects of converſation appear impertinent, and are in reality as intolerable to him as the everlaſting theme of his own complaints generally is to others: Meanwhile, as this diſeaſe is in reality more diſtreſſing than dangerous, and as his looks are not impaired in a degree that correſponds with the account he gives of his diſtreſs, he ſeldom meets

meets with that ſympathy which his ſenſibility requires and his ſufferings deſerve. To a circumſtantial and pathetic hiſtory of his complaints, he often receives a careleſs, and, to him, a cruel anſwer, importing that they are all imaginary. One who feels a weight of miſery more burthenſome than acute bodily pain, naturally conſiders this as the greateſt inſult. Shocked at the unkind indifference of friends, and the callous diſpoſition of mankind in general, he ſhuns his former ſociety, confines himſelf to his chamber, and will admit nobody but his phyſicians, for if he can at all afford it, he conſults one after another, the whole tribe. Being bribed to that patient hearing of his complaints, and that appearance of ſympathy which the reſt of his acquaintance refuſe, they ſeem more tolerable company, and they poſſibly relieve or palliate the coſtiveneſs, the flatulency, the acidities, and other ſymptoms which are brought on by the anxiety

anxiety attendant on this complaint; but the original cauſe affecting the ſenſorium they leave as they found it. This cauſe continuing in ſpite of all their bitters, and their ſtomachics, and their purgatives, and analeptics, the ſame ſymptoms conſtantly recur. The wretched patient growing every hour more irritable and peeviſh, he flies at length to quacks. Their well-atteſted and infallible remedies hurry on the bad ſymptoms with double rapidity; he returns to phyſicians, goes back to quacks, and occaſionally tries the family noſtrums of many an old lady. His conſtitution being worn by fretfulneſs and by drugs, he at length deſpairs of relief, and either ſinks into a fixed melancholy, or rouſed by indignation, his good genius having whiſpered in his ear, *fuge medicos et medicamina*, he abandons the ſeat of his diſappointments, tries to diſſipate his miſery by new objects and a different climate, conſults no practi-

tioners of any country, ſex, or denomination; and forms a fixed reſolution to ſwallow no more drugs, from which happy epoch, if the caſe be not quite deſperate, he has the beſt chance of dating his recovery.

The diſeaſe now deſcribed, though accompanied with ſome of the ſame ſymptoms, is to be diſtinguiſhed from a direct affection of the ſtomach and bowels, impeding the proceſs of digeſtion, and occaſioning want of appetite, heart-burn, acidities, flatulency, coſtiveneſs, and at length, if the cauſes of theſe complaints are not removed, dejection and other nervous ſymptoms.

It is alſo different from what is called the hyſteric diſeaſe in women, which, beſides the ſymptoms above enumerated, is peculiarly accompanied with a pain in the left ſide of the belly, with the ſenſation of a ball riſing from the ſtomach to the throat,

and threatening ſuffocation, with alternate fits of laughing and crying, with faintings and ſpaſms.

What moſt eſſentially diſtinguiſhes the hypochondriaſis from thoſe two diſorders is, that the former gradually overſpreads the mind in the firſt inſtance, and often without any known cauſe of grief and vexation: The other ſymptoms are ſecondary, occaſional, and produced by the long continued influence of the former; whereas indigeſtion and the hyſteric diſeaſe do not neceſſarily originate in any affection of the mind, the firſt proceeding from a weakneſs of the muſcular fibres of the ſtomach, too great delicacy in its nerves, or ſome fault in its digeſtive fluid; and the various and extraordinary ſymptoms of the ſecond originating in peculiar affections of the uterus, irregularities in the menſtrual periods, and great ſenſibility.

In

In a word, in the hypochondriaſis the mental affection or dejection of ſpirits is primary, and the other ſymptoms ſecondary. In the other two complaints, the alimentary canal or the uterus are diſordered in the firſt place, and the mental affections are ſecondary *.

Another important diſtinction between theſe two diſorders and the hypochondriaſis is, that the former may be diminiſhed, and in many inſtances entirely removed, by the judicious application of bracing, deobſtruent, carminative, and ſedative medicines;

* As women are ſometimes thrown into hyſterical fits by being contradicted, by a ſudden fright, or ſome violent emotion of mind, thoſe inſtances may be thought inconſiſtent with this opinion. I will ſay nothing of the fits which ſeem to be owing to contradiction; but as to the others, when we recollect that it is only during thoſe years of life in which menſtruation exiſts, that women are ſubject to hyſterical fits; that they are moſt liable to come while the period is actually on them; that obſtructions, independent of any other cauſe, occaſion them; that unmarried women are more ſubject to them than thoſe who are married, and the barren than thoſe who have children; we muſt think that hyſterical complaints depend on ſome affection of the uterus or ovaria.

whereas the chief aſſiſtance we can give in the latter muſt be derived from other ſources.

I ſhall here terminate the propoſed view of certain parts of the animal œconomy. Curſory and incomplete as this may be deemed, it is ſufficient to ſhew the folly and preſumption of thoſe who pretend that it is in their power to remedy every diſorder in a ſyſtem whoſe eſſential functions are imperfectly underſtood; it ſhews at the ſame time that ſo far from being ſurpriſing that the art of medicine is unequal to the taſk of curing every diſeaſe to which the human conſtitution is expoſed, it is rather wonderful that it can give ſo much relief as in certain caſes it actually does.

In no other art can the artiſt contribute to the rectifying a diſordered machine of whoſe ſtructure he has an imperfect knowledge, and ſome of whoſe principal ſprings he

he is excluded, by unſurmountable obſtacles, from examining.

That the phyſician has this in his power, depends indeed upon a circumſtance in the animal conſtitution which no production of human art can boaſt—the conſtant tendency, ſo often mentioned, in diſeaſed nature to reſtore itſelf.

If the productions of art poſſeſſed the ſame advantage; if, when the movements of a machine were by any accident impeded, it had within itſelf the power of throwing out the obſtructing cauſe; or when a ſpring chanced to break, if it could ſolder and heal ſpontaneouſly, we might then ſee men riſe to eminence in the mechanical employments without underſtanding the common principles of their art.

When a watch went irregularly, we ſhould ſee men totally ignorant of its mechaniſm undertake to put it to rights with all the

eaſy confidence imaginable. They would perhaps gravely open the caſe, look with becoming ſagacity through a glaſs at the wheels, aſſume an air of profound reflection, give it a random ſhake, and then aſſure the owner that all would be well in a ſhort time. If after this, by its own energy it happened to recover its movements, the artiſt would of courſe have the credit; but if unfortunately it did not, he would then ſhake it again, according to a new method; and if that failed, give it over as deſperate.

But as neither watches nor any other of the works of art are endowed with the faculty of reintegration, the artiſt, before he undertakes to mend them when out of order, is under the indiſpenſable neceſſity of underſtanding their ſtructure and the laws by which they act.

And notwithſtanding that ſome ſucceed without it, yet upon the whole, thoſe who apply

apply to the art of medicine had beſt follow the ſame plan, and ſtudy the animal œconomy and the nature of diſeaſes with as much aſſiduity as if, like the watchmaker, they had nothing but their knowledge to depend upon. But whatever their acquired knowledge may be, they muſt always remember that Nature is the greateſt of all phyſicians, and that their chief buſineſs is to watch with all poſſible attention which way her ſalutary efforts point, that they may, by every means which their knowledge of the animal ſtructure and œconomy, and their own experience, or that of others, has taught them, aſſiſt Nature in thoſe efforts.

MEDICAL SKETCHES,

PART THE SECOND.

I.

OF FEVERS IN GENERAL.

I NOW proceed to offer a few remarks on certain diſeaſes. I begin with fevers, becauſe the diſorders which have been arranged under that denomination are the moſt common and univerſal of any to which the human body is liable.

When the circulation of the blood is quicker, and the body is hotter than is natural, there exiſts a certain degree of fever.

The moſt part of diſeaſes are attended with an uncommon quickneſs of the pulſe, and

and heat; a greater or leſſer degree of fever therefore is a ſymptom of moſt diſeaſes.

What is commonly underſtood by the term *fever*, however, is a complaint beginning with a ſhivering, or, at leaſt a ſenſation of cold, ſoon followed by a quick pulſe, univerſal heat, and diſorder of the natural functions, but not originating from a wound, or the direct affection of any particular part of the body.

When an affection of any part in particular, whether from an internal cauſe or an external injury, is the primary and eſſential complaint, the fever which accompanies this is conſidered as a ſymptom only, and the diſeaſe is not denominated a fever; but when the cauſe of ſuch a local affection is internal, the diſeaſe derives its name from the organ affected; and if it proceeds from an external injury, it is ſimply called a wound or bruiſe.

Thus an inflammation of the membrane that lines the interior ſurface of the thorax (the

(the pleura), is called a pleuriſy, an inflammation of the kidneys a nephritis, of the liver hepatis, and ſo on.

As fevers ariſe from different cauſes, affect people of different conſtitutions, vary in different climates and ſeaſons, they muſt of courſe be different in their nature, and require a different treatment.

Notwithſtanding thoſe differences, there are certain ſymptoms and circumſtances common to all, which unite them under the general name of fevers.

The eſſential ſymptoms common to all fevers at their firſt attack are, languor, wearineſs, and ſoreneſs of the fleſh and bones, followed by a ſenſe of cold, which beginning in the back gradually creeps over the whole body. This coldneſs, in ſome, is attended with gentle irregular ſhudderings, in others with a ſtrong fit of ſhivering, with paleneſs of the ſkin and lips, dryneſs of the mouth, a want of appetite, an inability to ſleep, impaired ſenſibility, and often ſome degree

degree of confuſion of thought. The coldneſs is ſucceeded by an uncommon heat over the whole body, and the dryneſs in the mouth, by great thirſt. At laſt a ſweat, more or leſs profuſe, breaks forth, and the body becomes in ſome degree cooler, or perhaps returns intirely to its natural ſtate.

Diviſion of Fevers.

If the diſeaſe concludes within the ſpace of twenty-four hours, it is called by phyſicians an ephemera, or a fever of one day.

If the ſame ſymptoms regularly return and go off at the ſtated intervals of one or two days, the diſeaſe is an ague, or intermittent fever.

If, with little or no evident abatement, the diſeaſe proceeds with equal, or increaſing violence, it is then called a continued fever.

The term is not ſtrictly accurate; for there is reaſon to believe that all fevers, except ephemeræ, are attended with diurnal

nal exacerbations and remiſſions. As thoſe, however, are very different from the intervals above mentioned, often eſcape the notice of the careleſs, and ſometimes are diſtinguiſhed with difficulty by the moſt attentive obſervers; fevers are with propriety divided into two claſſes, the continued and the intermittent.

The latter are readily diſtinguiſhed from the former by the total abſence of fever during their intervals; and they are diſtinguiſhed from each other by the names quotidian, tertian, and quartan, according to the duration of thoſe intervals.

Diviſion of continued Fevers.

Continued fevers have been divided and ſubdivided by various authors with ſuch a parade of learning, and ſuch an affectation of preciſion, as terrifies the diffident ſtudent and perplexes the moſt experienced practitioner.

Who

Who would not be alarmed on being informed that such a formidable band, such a febrium cohors as the following, had invaded the earth—febris inflammatoria, scorbutica, soporosa, putrida, nervosa, typhus petechialis, flava, sudatoria, colliquitiva, ardens, hectica, cephalalgica, bilosa, erysipelacea, synocha, synochus, paludosa, verminosa, maligna, &c. &c. &c. And after being thus informed, who could be surprised to find that death walked with a hastened step through the land *? To lay hold of the occasional symptoms which arise from the differences of constitution and other circumstances, and erect them into new diseases with terrifying names, burdens the memory, and tends to darken rather than elucidate.

* ——— Nova Febrium
Terris incubuit cohors:
Semotique prius tarda necessitas
Lethi, corripuit gradum. Hor. lib. i. carm. 3.

He

He who breaks a loadſtone into a great number of pieces will throw as little light upon the nature of magnetiſm, and diſcover as little of its cauſe, as if he had left the loadſtone entire.

To give terms inſtead of ideas, is a practice not confined to phyſicians: From long eſtabliſhed cuſtom, however, ſuch counters ſeem to paſs more currently, and are oftener received in exchange for gold, from them than from others.

Thoſe who are ſolicitous to be thought profound, do not always wiſh to be intelligible; they gain their purpoſe more effectually without it. My chief aim, on the preſent occaſion, is to be uſeful. I muſt therefore endeavour in the firſt place to be fully underſtood.

I do not pretend, by any new ſyſtem, to explain what writers of far greater genius have left in obſcurity; but perhaps giving ſome of their ideas in a plainer and ſimpler

dreſs, and adding ſuch of my own as experience and reflection have confirmed, will be of ſervice.

Two very different ſtates of the human body are ſuppoſed to accompany the diſeaſes comprehended under the name of fevers, and to form their great and fundamental diſtinction.

One is called the phlogiſtic diatheſis, or inflammatory diſpoſition; by which the heart is excited to rapid and ſtrenuous exertions, during the continuation of which there appears great ſtrength in the action of the veſſels, and the blood itſelf ſeems to be of a firmer and denſer texture than uſual.

In the other, the brain and nervous ſyſtem are more directly affected, their energy ſeems impaired, the force of the heart and veſſels is diminiſhed, the blood is of a looſer texture, and in a more diſſolved ſtate, and the animal juices tend, as ſome have imagined, to putrefaction.

In

In the firſt ſtate, when the inflammation originates from external cauſes, as wounds, contuſions, or burns, the fever follows the local affection, and is in proportion to the degree of inflammation, and to the importance of the part or organ affected.

This is alſo the caſe in certain diſorders of the lungs, liver, and other viſcera, which ariſe not from external injuries, but from ſome vice in the part which gradually brings on inflammation, and the inflammation fever.

If the local inflammation is removed, the fever is removed alſo; if it cannot be removed, but increaſes, gradually deſtroying the organization of the part, the patient dies ſometimes by the violence of the fever, and ſometimes merely becauſe an organ neceſſary to life is deſtroyed.

In all theſe caſes therefore, the diſeaſe is not a fever, but a local inflammation producing feveriſh ſymptoms.

Theſe ſymptoms are ſhiverings, a ſtrong, hard, and full pulſe, heat, thirſt, reſtleſſneſs; and if any blood is drawn, a thick gluey ſubſtance of a buff colour will be ſoon formed on its ſurface.

But it often happens that people are ſeized with ſhivering, and all theſe ſymptoms in a ſtrong degree, without any external violence, or the affection of any particular organ.

In this caſe the ſymptoms being the ſame with what occur in local and viſible inflammations, the whole maſs of blood is ſuppoſed to be affected in the ſame manner as when they evidently exiſt, and this diſeaſe is naturally enough called an inflammatory fever.

The other ſpecies of fever, when pure, diſplays ſymptoms very different, and in ſome reſpects oppoſite to this inflammatory irritation.

Weak and quick pulſe, debility, and proſtration of ſtrength, heavineſs and dejection of ſpirits, as if the vital principle were invaded by ſome baleful influence acting directly on the nervous ſyſtem;—thoſe and other ſymptoms have procured this fever the name of nervous.

When the ſame ſymptoms attack with a greater degree of violence, it has been called malignant; and as duſky brown, violet, or black ſpots, and vibices or blue marks like bruiſes, imputed to a putrid ſtate of the fever, ſometimes appear, it is alſo called the putrid fever.

Thoſe and various other circumſtances however, ſeem to form no eſſential diſtinction. The whole may be comprehended under one name; and provided the ſymptoms which diſcriminate this from the inflammatory fever be accurately deſcribed, it is of no importance which is choſen.

If fevers always were found in Nature as pure, unmixed, and diſtinct, as they are deſcribed in authors, the labour of thoſe who apply their minds to the ſtudy of medicine might be greatly abridged.

Aſk a very young ſtudent of phyſic what is to be done in an inflammatory fever, and he will anſwer, without heſitation, that you muſt bleed and dilute.

Aſk again what is to be done in a nervous, malignant, or putrid fever, and he will anſwer with equal readineſs, you muſt give the bark, &c.

Carry him to the bed-ſide of a patient with a pretty ſtrong and hard pulſe, conſiderable heat and dryneſs of the ſkin; here, he will ſay, is a vigorous motion at the centre of the vaſcular ſyſtem, with great contraction, and ſtrong reſiſtance by the veſſels at the circumference; to allay the internal commotion, and relax the ſpaſm, plentiful veneſection muſt be uſed, and great quantities

tities of cooling bland diluting liquors muſt be drank; but on farther examination, he finds uneaſineſs in the head, nauſea, dejection, and impaired ſenſation and debility, ſymptoms indicating a direct nervous affection, and for which, had he found them unaccompanied by the former, he would have preſcribed corroborants, cordials, and antiſeptics; but finding them thus combined together, he does not know whether to call the diſeaſe inflammatory or nervous, and of courſe is at a loſs what to preſcribe.

In reality, it requires much experience, ſagacity, and attention, to decide what courſe ought to be followed in thoſe complicated caſes, where the two genera are ſo intimately blended, as often happens in the continued fevers of this iſland.

The Cauſes of Fevers.

It is uſual for writers to enumerate what they conſider as the cauſes of fevers; theſe

they divide into two claſſes, the remote and the proximate.

Under the firſt head ſome have favoured the public with a liſt of almoſt every thing that can diſorder the human body.

Full diet, thin watery diet, hot diet, too great exerciſe, too little exerciſe, drinking cold watery liquors when the body is hot, warm liquors when the body is cold, and ſpirituous liquors whether the body is hot or cold; plethora, hemorrhages, ſtopping of iſſues and other evacuations, the retention of excrementitious or other offenſive matter in the ſtomach and bowels, cold dry winds, moiſt weather, hot weather, change of climate, night-watching, intenſe thought, venery, fear, grief, anxiety, the miaſmata, or certain particles floating in the air, and which ariſe from marſhy grounds acted upon by heat, and the effluvia which conſtantly flows from living human bodies pent up or confined from being diffuſed in the atmoſphere.

What

What produces many miſtakes and difference of opinion reſpecting the cauſes of diſeaſes, is, that we know little or nothing of the relation between cauſe and effect, but merely that we ſee the one follows the other.

When a philoſopher holds any thing in his hand, a leaden bullet for example, he knows it will fall to the ground on his ſpreading his fingers; the moſt ignorant peaſant knows the ſame, and for the ſame reaſon, becauſe he has ſeen it always happen ſo.

The difference between the philoſopher and peaſant is, that the former will endeavour to find out why it always happens ſo; whereas the latter will be fully convinced he knows it already, and that he could have foretold that lead and every heavy ſubſtance, muſt neceſſarily fall to the ground, although he never had ſeen or heard of ſuch a thing in his life: Nothing can be clearer, he would ſay, than that a bullet

muſt fall to the ground, when it is not ſupported.

Yet it is evident that it might have been as natural, for aught he or the greateſt philoſopher alive knew before trial, for the bullet or any other ſubſtance to have mounted upwards, have taken an horizontal direction, or remained ſelf-ſuſpended in the air.

And although the philoſopher ſhould never be able to diſcover any other relation between two events, but that the one always follows the other, he will agree with the peaſant in calling the firſt the cauſe of the ſecond, and all the world will follow their example.

If we ſee the events happen in this ſucceſſion in a great number of inſtances, although the ſecond ſhould happen without being preceded by the firſt in a few, ſtill we will ſuſpect the firſt for its cauſe, notwithſtanding that ſomething or other, we do not know what, prevents its appearance in ſome caſes;

caſes; this however raiſes doubts; we are not quite ſo certain as we were.

But fevers are not always and regularly preceded by the ſame events, but ſometimes by one, ſometimes by another, and ſometimes by a number together; in ſuch caſes therefore, we need not be ſurpriſed that there are frequent miſtakes and a variety of opinions reſpecting their cauſes.

Indeed, if the catalogue of cauſes above enumerated is admitted, we never can be at a loſs for a cauſe for a fever or any other diſeaſe, for few events of our lives are not preceded by ſome of that liſt.

But it is evident that the greateſt number of them have at moſt only a tendency to prediſpoſe the body in ſuch a manner, that ſome ſucceeding cauſe, which of itſelf might not have been ſufficient to induce a fever, may have that effect; or if the ſucceeding cauſe would have been ſufficient to produce a fever, the prediſpoſing cauſes above

above enumerated may render the diſeaſe more obſtinate and dangerous.

I ſhall examine only a few of thoſe remote cauſes, under which the greater part of the others may be naturally enough included.

I begin with cold.

Sydenham ſays, Cauſa evidens externa febrium quamplurimarum inde petenda eſt, quod quis ſcilicet vel præmaturius veſtes abjecerit, vel exercitio incaleſcens ſe frigori incautius expoſuerit; and a little after he adds, Et ſane exiſtimo plures modo jam deſignato, quam Peſte, Gladio, atque Fame, ſimul omnibus perire.

This laſt ſeems a very ſtrong expreſſion, but is probably applied to all who die in conſequence of obſtructed perſpiration.—Whether the diſorder it produces be what is properly called a fever, or a peripneumony, an hepatitis, or any other diſeaſe; in this ſenſe and in this iſland, unqueſtionably more people

people are deſtroyed by the cauſes mentioned by Sydenham than by the plague, ſword, and famine.

Expoſing the body for any length of time to a greater degree of cold than it has been accuſtomed to, is evidently the ſource of a very great number of diſeaſes.

The immediate effect of this is a contraction of the pores on the ſurface of the body, by which means the fluid particles which uſually paſs this way are retained, and thrown back into the general maſs, which when long continued is found greatly to diſturb the animal functions.

Knowing that ſtoppage of perſpiration ſometimes produces dangerous diſeaſes, it is natural to be ſurpriſed that diſeaſes are not ſtill more frequent; that they do not happen in conſequence of every change from a warm climate to a cold, or of every change from warm to cold weather, or of remaining for any time in a colder room than we

are

are accuſtomed to; or, in ſhort, of all thoſe ſtoppages or diminutions of perſpiration which muſt happen to the moſt wary. This would inevitably be the caſe if Nature did not contrive to prevent it, by inveſting the different organs of ſecretion with the power of mutually aſſiſting each other; a deficiency in one being generally compenſated by the augmentation of ſome other.

The agreeable viciſſitude by which an intermediate ſeaſon is always placed, between the heat of ſummer and the cold of winter, is another means by which Nature guards againſt the diſeaſes to which the human body would be liable, if it were not thus gradually prepared for the ſucceeding extreme by a moderate intervening ſeaſon.

But the admirable arrangement by which each ſeaſon is blended with that which precedes it, and then by degrees aſſumes the nature of that which is to follow, although it certainly prevents in a great meaſure

meaſure the deſtructive effects which a ſudden change from ſummer to winter, and from winter to ſummer, would have on the human conſtitution, does not *entirely* hinder the ſucceſſive ſeaſons from producing changes in our bodies which diſpoſe them to particular diſeaſes, as is evident from the nature of the epidemics peculiar to the different ſeaſons, which are more regular in many other countries than in the variable and uncertain climate of Great Britain.

Cold is found, by univerſal experience, to give a diſpoſition to inflammatory diſorders, and heat to thoſe of that nature which has been called putrid. During the winter, and early in the ſpring, pleuriſies, peripneumonies, inflammatory anginas, rheumatiſms, and inflammatory fevers, prevail. Towards the end of ſummer, and particularly in autumn, fevers of a different nature, dyſenteries, and putrid ulcerous ſore throats, make their appearance.

If

If the former are more frequent in the ſpring than during the winter, this is imputed to the cold being more ſteady in winter; whereas in ſpring many people are tempted, by the heat of mid-day, to throw off part of their clothes, and contract diſeaſes from the unexpected chilneſs of the ſame evening.

That autumn is more unwholeſome than ſummer is thought to be owing to this, that the human body, after being relaxed by the long heats and enervated by the profuſe perſpiration of the ſummer, is then more affected by the cold of autumn; and likewiſe becauſe the air then abounds with the exhalations of putrid animal and vegetable ſubſtances, which are thought to have a morbid effect on the human body.

Of late it has been doubted by ſome phyſicians of great eminence, whether cold alone, without the concurrence of other cauſes, particularly marſh or human effluvia, can produce a proper fever.

But

But when a perſon, upon throwing off part of his clothes, or on remaining in a cold or moiſt place for an unuſual length of time, is immediately ſeized with a fever, in my opinion it is highly reaſonable to think the cold, to which he has been unaccuſtomed, is the cauſe, and not thoſe effluvia or miaſmata, call them what you pleaſe, which, for aught we know, he has been inſpiring and abſorbing, in as great quantities at other times, as when he fell into the fever.

It may be ſaid indeed that there is no proof that thoſe miaſmata have not had a great effect at this particular time, although they had none before. But if a perſon fell down ſenſeleſs, in conſequence of a violent blow on the head with a bludgeon, it might alſo be ſaid that the blow would not have had ſuch an effect without the concurrence of an apoplexy which the perſon was ſeized with, at the inſtant he received the blow: And whoever aſſerted this might reſt ſecure

that

that there could be no abſolute proof to the contrary.

All that can be ſaid is, that when we ſee people ſeized with inflammatory fevers after their bodies have been expoſed to the impreſſion of a ſharper cold than uſual, and for an unuſual time, we have the ſame reaſon to believe that cold is the cauſe of the fever, that we have for believing that any cauſe produces any effect.

Although it is true in general, that cold occaſions a diſpoſition to diſeaſes of an inflammatory, and heat to thoſe ſuppoſed to be of a putreſcent nature, yet thoſe who are conſtrained by neceſſity or by duty to take violent exerciſe in ſultry weather, and thoſe who accidentally fall aſleep on the ground expoſed to the beams of a mid-day ſun, are ſometimes ſeized with fevers of a highly inflammatory and dangerous nature; the inflammation directly affecting the brain itſelf or its membranes.

It would ſeem that heat gradually and uniformly applied has a conſtant tendency to relax and debilitate the human conſtitution; for we find in general that the inhabitants of hot climates are more effeminate and leſs capable of great exertions than thoſe of the moderate and of the colder; and we alſo find that the common diſeaſes of the warm climates are of a nature the reverſe of inflammatory. Yet ſudden and exceſſive heat from ſevere exerciſe in a hot day occaſions the moſt violent inflammatory fevers, as too much heat partially applied occaſions the moſt violent local inflammations. But where no ſuch exceſſes have been ſuddenly uſed, only the heat of ſummer allowed to act gradually on the body, there can be no doubt that it tends to remove from the conſtitution the inflammatory diſpoſition produced by the cold of the preceding ſeaſons, and diſpoſes to diſeaſes of a contrary nature, attended very often with

diſorder in the ſtomach and bowels, and the appearance of a redundancy or acrimonious ſtate of the bile.

Towards the end of Auguſt, particularly after ſultry weather followed by rain, the diſeaſe called cholera, or a vomiting and purging of bilious matter, attended with ſevere gripings in the inteſtines, often prevails in this iſland.

There is every reaſon to believe that this diſeaſe flows from the heat of the weather producing an increaſed ſecretion of bile, and at the ſame time rendering this liquor ſo acrimonious as to produce painful irritation of the ſtomach and bowels. That this is the cauſe is the more probable, as the beſt method of removing the complaint is by throwing great quantities of mild diluting liquors into the body, which at once favour the evacuation of the redundant bile, blunt its acrimony, and ſheath it from irritating the alimentary canal.

About the ſame period, and proceeding from the ſame cauſes, the exceſſive heats of ſummer, followed by the moiſture of autumn, dyſenteries and the fever called bilious appear—a name firſt given to it on account of the bilious vomitings and purgings, the yellow colour of the ſkin, and other ſymptoms of a redundancy of bile which attend it.

A diſpoſition in the bile to paſs off in great quantities by its ſecretories, is obſervable in all warm climates as well as in warm ſeaſons. Thoſe who go from a cold to a hot climate, therefore, are generally ſoon after attacked with bilious fevers. There are ſtrong reaſons to believe, however, that this unuſual quantity of bile is to be reckoned among the effects and not among the cauſes of this fever, which in Great Britain is often of the mixed kind, generally beginning with inflammatory ſymptoms and ending with thoſe of debility and ſuppoſed putreſ-

cency; the increaſed ſecretion and acrimony of the bile aggravating the other ſymptoms of the fever.

In what degree it leans to the one or the other, in ſome meaſure ſeems to depend on the ſtate of the weather during the courſe of the diſeaſe, and the particular conſtitution of the patient; the robuſt and ſanguine ſhewing a ſtronger tendency to the former, and the weakly to the latter.

Intoxication is reckoned among the cauſes of fever.

The general bad effects of this upon the human conſtitution are too obvious to be inſiſted on.

Wherever a prediſpoſition to any particular diſeaſe lurks in the conſtitution, intemperance in drinking ſeldom fails to rouſe it into action.

Repeated exceſſes of this kind ſometimes produce the epilepſy in thoſe never before ſubject to it, and always haſtens the returns,

and augments the violence of the fits in thoſe who are.

I have known a ſingle inſtance of intemperance bring this dreadful diſorder back with violence upon thoſe who by former moderation had warded it off for years.

To increaſe good humour, gaiety, and wit, and prolong the pleaſure of converſation, is the uſual apology for ſuch exceſſes. But if it were a general rule to leave the company at ſoon as our taſte and talents for ſenſible or witty converſation began to diminiſh, few would injure their conſtitutions by drinking.

There are indeed examples of people who ſupport long and repeated exceſſes without much apparent injury.

There are alſo inſtances of people who have ſwallowed poiſon with impunity. But let thoſe who are acquainted with ſuch tough and well-ſeaſoned veterans recal to memory the numbers of their companions, who, yielding to importunity, have fallen

victims to this easiness of temper, and they will not be much encouraged by the example.

The daily practice of drinking to intoxication must be considered as improper, if there were no other argument against it than its depriving us of the advantage of an admirable and efficacious remedy in many disorders, as is well observed by the celebrated commentator on Boerhaave's aphorisms: "Illa autem acrimonia, quæ fermentatis liquidis inest, miro stimulo atque efficaciſſimo auctam cordis velocitatem efficere potest; unde in morbis languidis et frigidis vini et cerevisiæ generosioris moderatus usus adeo prodest. Immodico horum usu febres, crapulares dictas, excitari, nimis notum est; verum levia hæc sunt, solentque ab illis, quibus solenne est hesterna venas habere inflatas Iaccho, contemni *."

* Gerardi Van Swieten Comment. tom. secund. p. 31.

For

For although intoxication never fails when firſt indulged to produce moſt of the ſymptoms which attend fever, as heat, drowth, headach, and nauſea, it muſt be confeſſed that theſe wear away by habit; ſo that thoſe who indulge every day in the bottle, if they ſurvive the exceſſes of their youth, and eſcape conſumptions, dropſies, and paralytic complaints in more advanced life, are in little danger of being cut off ſuddenly by a fever from drinking; they will have the comfort of outliving not only their friends but very probably their own underſtandings.

Thoſe who are not habituated to intemperance are often thrown into violent fevers by that degree of exceſs which is barely ſufficient to put a perſon of the above deſcription into tolerable good humour, and diſpoſe him to a comfortable night's reſt.

In ſome inſtances where people have fallen down inſenſible by extraordinary

exceſs in drinking, a ſupervening fever has been conſidered as the only thing that ſaved them from a fatal apoplexy; as is remarked alſo by Van Swieten, who having quoted the following maxim from Hippocrates, "Si quis ebrius de repente obmuteſcat, con-" vulſus moritur, niſi eum febris corripue-" rit, aut qua hora crapula ſolvitur, vocem " edat," adds farther, "ſed in Commen-" tariis 558, ex Hippocrate notatum fuit " ſummam ebrietatem ſequi obmuteſcen-" tiam, et lethalem quandoque apoplexiam, " niſi febris orta remedia fuerit;" and then quotes from the third book of Hippocrates's Epidemics the inſtances of two perſons who "ex potibus ambo periculoſa febre decu-" buerunt; quorum primus ſecundo jam " morbi die ſurdus factus fuit, dein ferociter " deliravit, quarto die convulſus, quinto " die periit. Alter vero poſt difficilem " morbum, vigeſimo die evaſit."

What

What appears certain from theſe quotations, is the great danger of exceſſive intoxication; that in ſome caſes it inſtantly kills, in others produces a violent fever, of which ſome die, and others with difficulty recover; and that, in the opinion of Hippocrates and Van Swieten, the fever was the means Nature uſed to bring about the recovery. Some people will have the preſumption to diſpute the laſt article; but admitting it, ſtill it muſt be allowed that a diſeaſe muſt be of a very deſperate nature for which a fever is the only remedy, and this remedy not always effectual; for it ſometimes happens, particularly to young perſons of a ſanguine habit, that, in conſequence of great exceſs in drinking, a fever of ſuch violence is raiſed that the patient dies after a few days of high delirium.

Violent paſſions of the mind, particularly thoſe of *rage*, *fear*, and *grief*, are reckoned among the remote cauſes of fever.

There

There are doubtleſs inſtances of rage, when kindled to an exceſſive height, producing an apoplexy: The ſame paſſion in a ſmaller degree, or in a different conſtitution, it is ſaid, may produce a fever: I certainly ſhall not deny that it may, but I never knew an inſtance of it.

A ſudden fright is a very frequent cauſe of epilepſy, particularly in young people and children.

Fear inſtantly checks perſpiration, diſturbs all the ſecretions, and the natural courſe of the animal œconomy.

Grief has the ſame effects in a ſmaller degree; but the paſſion is generally of longer duration; both impair the appetite, retard digeſtion, diminiſh the energy of the brain, and the action of the heart; and diſpoſe the body ſo very much to the diſeaſe, that in this ſituation we frequently ſee a nervous fever ariſe, for which we can perceive no other cauſe.

Long

Long continued coſtiveneſs, and the retention of excrementitious or other offenſive matter in the ſtomach and bowels, is alſo claſſed among the cauſes of fever.

It is evidently the cauſe of loſs of appetite, nauſea, flatulencies, feveriſh heats, and much general oppreſſion; but I have never ſeen a formed fever, in adults, that I could impute to this cauſe alone.

When a fever takes place indeed, from whatever cauſe, coſtiveneſs generally follows, and unqueſtionably has a tendency to augment all the ſymptoms.

I ſaid I had never ſeen what could with propriety be called a fever, which originated in this cauſe alone in adults. I confined my expreſſion to thoſe of that claſs, becauſe I do think this cauſe, independent of any other that we can perceive, does produce fever in children, not only by ſtimulating the nerves of the inteſtines in the ſame manner that worms do, but alſo by part of the acrimonious matter being abſorbed and thrown

thrown into the maſs of blood by the lacteals.

It will be ſaid, that grown people are expoſed to thoſe cauſes as well as children: They are ſo; but they ſeem not to have the ſame effect on the firmer and leſs irritable conſtitutions of the one, that they have on the other.

If this reaſon is not thought ſufficient, another may be adopted. The fact remains unmoved.

In ſuch caſes no doubt, the firſt thing that is to be done, is to cleanſe the whole alimentary canal by proper purgations; but although this prevents more fuel from being added, it cannot at once extinguiſh the flame already kindled; the fever continues for ſome time, and requires a particular treatment.

For the removal of a cauſe does not always remove the effects, which ſometimes become the cauſes of new and obſtinate ſymptoms.

Exceſs

Exceſs in venery is alſo reckoned among the remote cauſes of fever.

The general effects of ſuch imprudence are languor, weakneſs, and dejection; and that this prediſpoſes or renders people more liable to be infected by the other direct cauſes of the nervous fever than they would otherwiſe have been, is moſt certain; and ſome people think exceſſes of this nature of themſelves may produce a nervous fever without any other cauſe.

The ſentiments expreſſed by Celſus on this ſubject ſeem highly rational: "Con-
" cubitus vero neque nimis concupiſcendus,
" neque nimis pertimiſcendus eſt. Rarus cor-
" pus excitat, frequens ſolvit. Cum autem
" frequens, non numero ſit, ſed natura,
" ratione ætatis et corporis; ſcire licet,
" cum non inutilem eſſe, quem corporis
" neque languor, neque dolor, ſequitur."—
CELSUS, lib. i. cap. 1.

But fevers are often epidemic, and numbers of perſons affected, on whom none of the cauſes above enumerated can be ſuppoſed to have operated, or cannot be ſuppoſed to have more force at the period when the epidemic prevails than at any other time.

They muſt therefore, in many inſtances, proceed from ſome other cauſe.

Certain noxious particles floating in the atmoſphere, and more prevalent, or more powerful, at particular ſeaſons, and in particular places, than in others, are accordingly conſidered as by far the moſt general cauſes of fevers. Thoſe miaſmata are ſuppoſed to be the effluvia of ſtagnating corrupted water, and putrefied vegetable and animal ſubſtances.

They are too minute to undergo the examination of our ſenſes, yet we can have little doubt of their exiſtence, and ſtill leſs of their being the chief cauſe of intermittent fevers; and combined with cold, the

frequent cauſe of the continued fever to which ſo many different names have been given; as bilious, remittent, &c.

The following conſiderations make this amount to a certainty.

Intermitting and remitting fevers abound in every climate, in the neighbourhood of moiſt marſhy ſoils; in woody countries, where the air is confined by the number of trees; in low flat countries, where there is a great quantity of ſtagnating water, and no hills to direct a briſk ventilation.

The inhabitants of the mountains and of the valleys, where there are running waters, a dry ſoil, and ſtrong ventilation, are not ſubject at all to agues, and very ſeldom to the bilious fever, while they remain in their own country; but in general are liable to be ſeized with one or other, when they come to the fenny countries.

Even in thoſe countries the richer ranks of inhabitants who have dry apartments above

above ground, are leſs liable than the poorer ſort, who are obliged to continue longer in the fields, expoſed to the baneful influence of the marſh miaſmata, and ſleep on ground floors.

Of the pooreſt ſort, the inhabitants of the towns and larger villages, where the noxious quality of the atmoſphere is corrected by numerous fires, and ventilation is produced by the arrangement of the houſes into ſtreets, are leſs ſubject to the diſorders in queſtion than thoſe who live in detached cottages.

The bilious remitting fever very ſeldom originates on board a ſhip; but it is often carried on board by ſeamen or ſoldiers who have caught it when on the watering duty, cutting fuel, or on any other ſervice which required their being on ſhore. There are inſtances of ſeamen's having been put on ſhore on account of the ſcurvy; and although

though the freſh vegetables they then obtained ſoon cured them of that diſeaſe, yet if the country on which they landed was marſhy, and in the neighbourhood of woods, it has been obſerved, that they ſoon afterwards were ſeized with bilious remitting fevers*.

The ſeaſon in which fevers are moſt prevalent, is the end of ſummer and beginning of autumn, when heat and moiſture combine to haſten the corruption of animal and vegetable ſubſtances, and fill the atmoſphere with an unuſual quantity of miaſmata.

Thoſe conſiderations render it next to a certainty, that ſomething eſſentially connected with a marſhy ſoil produces fever; and we can ſuppoſe nothing with ſo much probability as the effluvia of ſtagnating

* Vide Medical Obſervations and Inquiries, by a Society of Phyſicians, vol. iv. article 12.

We are there informed, that in one ſhip the officers who never had the ſcurvy on ſleeping aſhore one night, were ſeized with this bilious fever; ſo were the carpenters and boat's-crew, who were neceſſarily aſhore: All who remained aboard continued free from it.

water, and corrupting vegetable and animal ſubſtances.

And if a ſudden ſtoppage of perſpiration, from the cold of autumn, after the body is relaxed by the preceding heat of ſummer, is ſufficient of itſelf to produce fever in dry and well ventilated countries, where there is no reaſon to think that marſh miaſmata prevail, we cannot be ſurpriſed to find them far more univerſal, and more obſtinate in low and marſhy ſoils, where the firſt cauſe concurs with the ſecond.

But there is another cauſe more active than either, or than all the others taken together, in producing fevers of peculiar danger and malignity;—the effluvia conſtantly flowing from the living human body, which when long confined in the ſame place, and prevented from expanding in the atmoſphere, becomes in the higheſt degree acrimonious, and the cauſe of fevers equally contagious and malignant.

Wherever

Wherever numbers of people are crowded together in close places, the air of which must soon be deprived of part of its vital power, by repeated respiration, this infectious matter will be formed; but with most rapidity in jails, in the holds of ships, and in hospitals, where its virulent tendency is hastened by nastiness, by unwholesome food, by desponding thoughts, or by the effluvia coming from bodies in a diseased state.

It communicates its contagion not only to those who approach the places in which it is generated, and the human bodies from which it flows; but also will remain long entangled in blankets, beds, and other substances which have been in contact with the patient's body; retaining its activity, and capable of infecting others at a considerable distance of time, or at a considerable distance of place, if unhappily those contaminated materials are carried to a distance.

In this manner one perſon who is not himſelf infected may infect another, the firſt being leſs prediſpoſed to the diſeaſe than the ſecond, and carrying the infection in his clothes from one in the fever, to another perſon in good health.

Although the contagious miaſmata ariſing from the living human body, are not perceived to act at a great diſtance from their direct ſource, or the ſubſtances with which they are imbued; yet it ſeems moſt probable that they do not immediately loſe their virulency, but, after they are diffuſed in the atmoſphere, continue in ſome degree to act in conjunction with the miaſmata of marſhes, with heat, obſtructed perſpiration, and the other cauſes, in producing fevers; and according to the various proportions of thoſe cauſes, combined with the circumſtances of ſeaſon, climate, and the conſtitution of the patient, the nature of the fever is determined.

Having

Having pointed out what are conſidered as the moſt common cauſes of fevers in general, I ſhall ſhortly hint what appears to be the moſt probable ſource of each particular ſpecies of fever, according to the diviſion adopted above.

Other circumſtances may aſſiſt, or poſſibly on ſome occaſions produce them; but in general it appears that the effluvia of marſhes is the cauſe of intermittent fevers.

Cold, of the inflammatory fever.

The human miaſmata, of the nervous fever.

And that the mixed fever is the product of all the three ſources, which as they happen to be proportioned, incline it ſometimes to the nature of the inflammatory, ſometimes to that of the nervous fever; and from the marſh effluvia it derives its remitting tendency, with other features reſembling the intermitting fever.

It would not be a difficult matter to ſupport this conjecture by plauſible reaſoning

and illuſtration; but it is of little importance in itſelf, and of perfect indifference to me, whether it be believed or not.

Whatever may be the general or particular cauſes of fevers, none of them act with ſuch certainty at all times, as that fever *muſt* follow, as often as the human conſtitution is expoſed to their influence.

For although experience proves, that fevers of an inflammatory nature prevail in cold weather, and thoſe of a remitting kind after heat and moiſture; yet experience affords many exceptions to this general courſe, and ſometimes affords examples of the reverſe.

We alſo ſee people ſeized with fevers at ſeaſons when no epidemic reigns, and when they have not been expoſed to any of the cauſes which are conſidered as the ſources of that diſtemper.

And we ſee others preſerve perfect health during the progreſs of the ſevereſt epidemics, and notwithſtanding their being by neceſſity or imprudence much expoſed to the infection.

For beſides all the remote cauſes of fever, there muſt alſo be a particular diſpoſition in the conſtitution of the individual, to favour the action of the morbific cauſe, and render him ſuſceptible of the diſeaſe, without which, however much he may be expoſed to the other remote cauſes, he will not, at that particular time, be ſeized with it.

Perſons of a ſanguine habit are certainly more ſubject to inflammatory complaints than thoſe who are leſs plethoric; as the more delicate and weakly are found to be more liable to the nervous fever, than the ſtrong and robuſt. Other ſtrongly marked peculiarities of conſtitution may prediſpoſe to particular diſeaſes; but that important power in the conſtitution, by which it is

enabled to reject fever at one time, and of which it ſeems deprived at another, has never been explained.

Yet many chimerical ſyſtems intended to aſcertain this, and demonſtrate the immediate cauſes of all fevers and all their differences, have been received as ſatisfactory in different ages, being introduced by the influence of ſome great name, and agreeable to the prevailing philoſophy of the times.

The different temperaments of the human body have been divided into the various claſſes of hot and cold, moiſt and dry; and from the proportions in which thoſe were mingled, the cauſes and nature of fevers were deduced.

At one period imagination ſo entirely got the better of judgment, that the cure of particular organs was expected from certain ſubſtances, for no other reaſon than a reſemblance

reſemblance between that ſubſtance and the organ diſeaſed. Thus euphraſia was recommended for complaints of the eyes, pulmonaria for thoſe of the lungs, lemons for thoſe of the heart, aſarum and ſatyrion on account of other chimerical reſemblances.

At another period all the phenomena of fevers were explained by the predominancy of acid, or of alkali, in the conſtitution; and at a different period nitre and ſal ammoniac having been obſerved to refrigerate water, a ſuppoſed preponderency of one or both of theſe was thought a ſufficient explanation of the cold fits of fevers. If the ſymptoms were very turbulent and ungovernable, their impetuoſity was thought to be clearly accounted for by the deflagration ſaid to reſult from the combination of ſulphureous and nitrous particles in the human body.—And when any conſtituent part of the blood or juices was ſuppoſed to prevail in undue proportion, or any particular morbid hu-

mour ſuppoſed to exiſt, thoſe enthuſiaſts ſeem to have been perſuaded it was in their power to precipitate, diſtil, or ſublimate them in the human body as they could any ſubſtance in a pot, an alembic, or a tire of arundels.

The chymical were followed by the mechanical phyſiologiſts, who ſaw wedges and darts in the animal fluids, with which they exceedingly annoyed all their antagoniſts, and finally drove their predeceſſors almoſt entirely from the ſchools of medicine.

Many ingenious and learned men adopted the idea, that the operations of the animal œconomy are to be accounted for on mechanical principles, and the cauſes of diſeaſes and operation of medicines, are to be explained by the laws of hydroſtatics.

There muſt however be unſurmountable difficulty in applying the laws which govern paſſive matter to living animals; and the axioms

axioms which are juſt when applied to inflexible pipes, will be found erroneous, and to lead into falſe calculations, when applied to thoſe which are elaſtic, and changing their capacity every inſtant.

An obſtacle of ſomething of the ſame nature prevents our forming concluſions that can be relied upon, concerning the effect of ſeptic and antiſeptic medicines on the living body, from the effect they are found to have on dead animal ſubſtances.

The experience of ages has proved, that the great and ultimate object of the art of medicine,—*the power of curing diſeaſes*, is more effectually attained by diligently obſerving the courſe and ſymptoms of diſtempers, and the effects of the means uſed for their relief, than by the moſt plauſible reaſonings on their ſuppoſed nature and cauſes. Yet the latter has proved more attractive to many ingenious men of the profeſſion, and, for a reaſon ſufficiently obvious,

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in a particular manner to ſuch as are employed in lecturing to ſtudents.

No ſyſtem was ever received with more univerſal approbation than that of Boerhaave. The acknowledged learning, ingenuity, and integrity of that illuſtrious profeſſor, aided the plauſibility of his theory in producing conviction.——The leading maxims of this ſyſtem is, that all local inflammation depends on obſtructions *ab errore loci*, as he terms it; that is, when globules of blood get by miſtake, as it were, into veſſels whoſe diameters are too ſmall to permit them to paſs.

That inflammatory fevers are owing to a viſcidity or lentor prevailing in the maſs of blood and ſtagnating in the capillary veſſels.

When this is attended with a particular acrimony in the juices, whether received before the fever, or formed by the fever itſelf, the diſeaſe he then ſuppoſes to be of the putrid claſs.

Such

Such is the foundation of the doctrine taught for many years by Boerhaave at Leyden, in his time the moſt celebrated ſchool of medicine in the world; and by the means of this he endeavours to explain all the phenomena of fevers, and to account for the various terminations of inflammation in reſolution, ſuppuration, gangrene, or ſchirrus.

His audience heard him with implicit belief, and ſpread his doctrine with all the zeal of conviction over Europe.

The ideas of Boerhaave acquired additional force and celebrity from the valuable commentaries and illuſtrations of one of his diſciples, the Baron Van Swieten, a man diſtinguiſhed by his learning and talents, and placed at the head of medicine in Germany, by the well-directed favour of the late Empreſs.

So that no theoretical ſyſtem of medicine was ever introduced more advantageouſly,

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was ſupported with greater abilities, or promiſed to be more permanent.

Of late, however, it has been ſtrenuouſly attacked, loſes ground daily on the continent of Europe, and in this iſland ſeems to be almoſt, if not entirely overturned. But from whatever cauſe it proceeds, there indiſputably does exiſt, during the cold fit of a fever, a ſtoppage of the blood and fluids in the minute arteries and excretory veſſels of the body, as appears from the paleneſs of the ſkin and lips, dryneſs of the ſkin and mouth, and the drying up even of iſſues and ulcers. Thoſe therefore who reject Boerhaave's explanation by a ſuppoſed viſcidity or thickening of the fluids, were obliged to account for all thoſe ſymptoms otherwiſe. They accordingly aſſert, that the fault does not lie in the circulating fluids, but in the extreme veſſels, which we are told are ſuddenly ſeized with ſuch a conſtriction as refuſes all paſſage to the

the blood as effectually as if it were converted into glue.

They inſiſt farther, that if this viſcidity were to be admitted, it muſt be ſuppoſed to take place *gradually*, and of courſe would require conſiderable time to be produced, and would indicate its progreſs by ſome uneaſy feeling or complaint; but the cold fit of fevers often attacks at once without any previous complaint, unleſs it is a ſenſe of weakneſs a ſhort time before.

In their opinion, therefore, a ſpaſmodic conſtriction of the extreme veſſels accounts for all the phenomena of the cold fit much more naturally, and is analogous to the effect of certain ſudden affections of the mind, as ſurprize and fear, which inſtantly produce the ſame phenomena.

Beſides, the lentor ſuppoſed, if it really took place in a liquor whoſe free circulation is eſſential to life, would never fail to prove mortal; but as people daily recover from inflammatory

inflammatory diſeaſes, this circumſtance alone is a proof that no univerſal lentor does take place in ſuch diſeaſes.

It is farther alleged, not only that there is no poſitive evidence of viſcidity, but that there is reaſon to believe that even at the beginning, as well as during the progreſs of inflammatory fevers, the blood is leſs viſcid than in perfect health; for it is natural to think that a thin liquor, other circumſtances being equal, will coagulate more ſlowly than a thick; and as it is found, in fact, that the blood of people labouring under inflammatory diſorders is longer in coagulating when drawn out of the body, than that of people in perfect health, thoſe who combat the notion of lentor preſume from thence that the blood of the former is the thinner of the two; and add, that the gluey buff-coloured pellicle which forms itſelf on the ſurface of inflamed blood, and was conſidered as an irrefragable proof of the morbid

morbid viſcidity in queſtion, is no proof at all, this pellicle being nothing elſe but the natural coagulable lymph of the blood left at the ſurface and forſaken by the red particles, which the ſlow coagulation of inflamed blood permits to fall to the bottom.

With regard to the theory of local inflammation *ab errore loci*, or blood globules getting into veſſels which from the narrowneſs of their diameters and conical form they cannot paſs, and which, it is ſaid, the ſucceeding fluid muſt propel with increaſing force, and produce the following ſymptoms; *ſwelling* and *redneſs*, by the accumulation of blood in the minute veſſels; *pain*, by the diſtention of thoſe veſſels; *heat*, by the agitation and rubbing of the globules; and *throbbing*, by the beating of the obſtructed artery; or in one word, produce *inflammation*.

All this is without ceremony or circumlocution now denied; and it is farther aſſerted, that when examined by a microſcope, the blood is ſeen to paſs through the arteries of an inflamed part with as much eaſe and more rapidity than through thoſe of a part not inflamed; and whether the part be inflamed or not, that when a red globule enters a veſſel too ſmall for its tranſmiſſion, it is forced back by the contraction of the veſſel; for the force of the heart in thoſe minute and diſtant arteries is ſpent, and has no effect, and the globule thus thruſt back enters ſome larger anaſtamoſing branch without occaſioning any obſtruction or ſtagnation.

The many ſenſible reflections and practical obſervations made by Boerhaave, and the judicious commentator on his works, will continue a permanent and uſeful monument of their knowledge and induſtry, although the whole fabric of their theory,

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ſo long conſidered as ſolid and ſubſtantial, ſhould vaniſh *like the baſeleſs fabric of a viſion.*

We need be the leſs aſtoniſhed at finding the theory of Boerhaave in danger of being overſet, when we conſider that one of the moſt important and comprehenſive opinions of all medical antiquity, which originally came from Hippocrates himſelf, and like a ſolid body falling from a vaſt height, ſeemed to acquire additional force as it deſcended through admiring ages, is now openly impugned, and its truth diſputed. The opinion in queſtion is, that a fever is nothing elſe but an effort of Nature to expel ſome noxious matter from the conſtitution; but before it can perform this, it is neceſſary very often that this noxious matter ſhould undergo coction. *Coction*, in medical language, is a term uſed to ſignify the proceſs by which Nature attempts to operate ſuch an alteration in this noxious matter as de-

prives it of its pernicious qualities, or renders it capable of being expelled through ſome of the emunctories of the body. The noxious matter however is ſuppoſed to be averſe to this coction, and ſtruggles againſt it with more or leſs ſucceſs, according to the virulency of the matter and the powers of the conſtitution. In this ſtruggle between the noxious matter and the conſtitution the fever conſiſts. When Nature is ſtrong enough to perform perfect coction and expulſion, health is immediately reſtored; when Nature is quite unequal to the taſk, the patient dies; when ſhe performs it imperfectly, there is an abatement of the diſeaſe; but a new effort muſt be made after a ſhort pauſe, and this is called relapſing into the fever.

This doctrine was believed with a degree of conviction that in general is only compelled by mathematical demonſtration, or given to the evidence of the ſenſes; and phyſicians were accuſtomed to ſpeak with

as much certainty of the coction which takes place in á fever, as of that carried on in their kitchens.

But this is the age of freethinking; and ſome daring ſpirits treat the whole of this venerable doctrine as a mere chimera.

" What can fevers, almoſt inſtantly pro-
" duced by cold or terror," ſay they, " have
" to do with morbific matter?

" The impreſſion of cold, or an affection
" of the mind, are neither a noxious ſub-
" ſtance coming from without, or generated
" within the body.

" When a fever with alarming ſymptoms
" is removed by the critical diſcharge of a
" little blood from the noſe, where is the
" coction?

" The blood diſcharged differs in nothing,
" as far as can be perceived, from what
" remains in the body.

" When the criſis is by ſweat, the ſame
" happens; nothing ſeemingly more mor-

" bific, no difference whatever can be dif-
" covered from that critical ſweat, and the
" ſame evacuation on any leſs important
" occaſion *.

" There are indeed diſeaſes," continue they, " of a different claſs, in which fever is " evidently the effect of a ſpecific kind of " morbific matter, received into the body, " and where an irruption takes place in " conſequence of the fever, which not only " clears the conſtitution of the noxious

* Fevers are ſometimes diſtinguiſhed by the nature of the noxious matter they are *ſuppoſed* to be ſtruggling to throw out of the body; and the various qualities of this hypothetical matter are deſcribed with as much accuracy as if it had been examined by a naturaliſt and analized by a chymiſt. The accuracy and minuteneſs of thoſe deſcriptions are ſometimes urged as proofs of the exiſtence of the matter in diſpute, and of the truth of the doctrine that fevers are efforts of Nature to throw it out of the body. Without entering into that queſtion, the deſcriptions of its qualities are certainly no better proofs of its exiſtence than the records of the trials and condemnation of witches are proofs that it once was the faſhion in this iſland for old women to ride through the air on broomſticks, and to have perſonal communication with Satan; or than the ruins of the ancient temples are of the exiſtence of Jupiter, Juno, Apollo, Venus, and all the deities of Greece.

" matter introduced, but deprives it of the " power of ever again receiving it."

Of this nature is the ſmall-pox, the chicken-pox, the meaſles, and ſome other ſpecific contagions of which the human body is ſuſceptible only once *.

But in thoſe inſtances it ſometimes happens that the fever terminates before the matter is expelled, and the contagious matter which produces the diſeaſe is never altered in its nature, or rendered mild and innocent by coction or otherwiſe, but is thrown out of the body, retaining all its original virulence and capable of infecting thouſands.

The objectors above alluded to, make no ſcruple therefore of aſſerting, that nothing that can with any propriety be called con-

* It is very ſingular that it is the *human* body only that is ſuſceptible of theſe particular contagious diſeaſes; the brute creation being entirely free from them as well as from the venereal diſeaſe.

coction of morbific matter, particularly if altering its nature be implied in that term, takes place in fevers; neither can any ſuch thing happen in the diſeaſes juſt mentioned, ſince the noxious matter which produces the diſeaſe is thrown out of the body as unconcocted and noxious as when it entered.

It has been attempted to give ſome idea of the nature of concoction, by comparing it to the proceſs of digeſtion, in which the different kinds of food, after remaining ſome time in the ſtomach, loſe their own peculiar natures, the finer parts being mingled and transformed into one uniform liquor before it enters the maſs of blood, and the groſſer being expelled out of the body; and during the proceſs of digeſtion it is obſerved that there is a diſturbance and uneaſineſs in ſome degree like that occaſioned by a ſlight fever. But the analogy fails in the moſt eſſential point; for even admitting that morbific matter received or formed in the body

body is the cauſe of fever, there is no evidence that any alteration is made upon it by the proceſs of concoction; but nobody will queſtion that a ſtriking one is made on food by digeſtion.

After all, thoſe who are the moſt averſe to the ancient doctrine of coction ſeem to object rather to the expreſſion than to the meaning; for while they deny that noxious matter received into, or formed within the body, is the proximate cauſe of fever, and that Nature concocts this matter during the courſe of the fever, and expels it, or renders it innocent before the diſeaſe terminates; yet they acknowledge, what comes pretty nearly to the ſame thing—they allow of the vis medicatrix naturæ.

Let us conſider for a moment what then is the ſtate of the controverſy.

The old orthodox doctrine is, that a fever is an effort of Nature to change or concoct ſome noxious or morbid matter that is in

the conſtitution, ſo as that it ſhall either be rendered quite innocent or thrown out of the body.

The new hereſy is, that there is no ſuch thing as coction of morbific matter, but that as often as the body is injured, Nature directly excites ſuch motions as are ſuited to remove the cauſe of the injury, obviate its bad effects, and reſtore the conſtitution to its wonted good health. The difference between the two doctrines is not prodigious.

The fate of every theory hitherto invented to explain the proximate cauſe of fevers, might, one would naturally think, deter from an attempt in which ſo many have failed; yet ſo partial are we to what we conceive to be our own original ideas, ſo natural are ſuch inveſtigations to the active and inquiſitive mind of man, and ſo neceſſary are diſquiſitions of this nature to thoſe whoſe profeſſion it is to lecture to medical ſtudents, that it is probable a new theory

theory will always be founded on the ruins of the laſt that is overſet.

The lateſt attempt of this kind was made by a perſon for whom I muſt ever have the higheſt eſteem, from whom I received my earlieſt medical inſtructions, and whoſe character and abilities will give weight to every opinion he adopts.—The theory in queſtion is ſhortly this:—Whether the remote cauſes of fever be fear, cold, contagious miaſmata, or whatever elſe; their firſt effect is that of diminiſhing the energy of the brain, and thereby weakening all the functions, particularly the action of the extreme veſſels.

Debility then is the firſt ſymptom of a fever, and the cauſe of the cold fit and a ſpaſmodic contraction of the extreme veſſels, particularly thoſe of the ſurface, ſuppoſed to attend it.

It is not found eaſy to explain how debility produces this ſpaſmodic contraction, but it is imputed to the *vis medicatrix naturæ*, or the law in the animal œconomy above mentioned, by which motions are excited to obviate the effects of any thing noxious to the conſtitution; and that the ſpaſm exiſts, appears from the ſuppreſſion of all excretions, and the ſhrinking of the external parts during the cold ſtage. This proves an indirect ſtimulus to the ſanguiferous ſyſtem, by throwing the blood back with violence upon the heart and large arteries, and exciting them to ſtronger and more frequent contractions; which increaſed action of the heart and arteries continues till it reſtores the diminiſhed energy of the brain, extends this energy to the extreme veſſels, overcomes the ſpaſm, reſtores their action, on which ſweat breaks forth, the other excretories are alſo relaxed, and the fever abates.

Such

Such (abridged and imperfectly ſketched) is the doctrine of fever taught by Dr. Cullen, a name which muſt give it weight, independent of its intrinſic merit; which no doubt will appear ſtill greater in the eyes of thoſe who have the advantage of hearing from the mouth of that enlightened phyſician, all the illuſtrations, explanations, and proofs which his ingenuity and eloquence can bring in its ſupport.

Whether it is in danger of falling, when it loſes thoſe great props; and whether it will be more or leſs permanent than its predeceſſors', is yet to be tried.

II.

OF INFLAMMATORY FEVERS.

IN treating of fevers in general, it was remarked, that in theſe diſeaſes the human body is liable to two morbid ſtates, with very different ſymptoms.

In one, the heart and whole arterial ſyſtem is ſtimulated to rapid and ſtrong exertions, while the nervous ſyſtem ſeems leſs directly affected.

In the other, the nervous ſyſtem is more immediately affected; there is a weaker exertion of the heart and arteries, and more evident ſigns of general debility.

The diſeaſe at preſent under diſcuſſion is accompanied with the firſt of theſe ſtates, and

and with many of the ſymptoms which attend local inflammation. From this laſt circumſtance it derives the name inflammatory.

Some phyſicians have aſſerted, that no inflammatory fever can exiſt without local inflammation.

This is ſaying, in other words, there is no ſuch diſeaſe as an inflammatory fever; for when there evidently is a local inflammation, the complaint is not called a fever, but derives a name from the part inflamed.

But thoſe who aſſert, that as often as the ſymptoms of this fever appear, there muſt be a particular inflammation of ſome part of the body, acknowledge at the ſame time, that they cannot always tell where that particular inflammation is, becauſe it may be in ſome internal, indolent, or inſenſible part, and conſequently is neither to be ſeen nor felt.

I do not know whether this manner of reaſoning will be thought *convincing*, but it certainly is *convenient*.

If along with the ſymptoms of fever, any particular part of the body is found in an inflamed ſtate, thoſe who ſupport the opinion in queſtion, tell you, this is exactly what they expected, and knew from the beginning to be the caſe.

And if you carry them to a patient who has all the ſymptoms of this fever, and yet *no partial inflammation* appears, they then tell you they are very ſorry you cannot ſee, nor the patient feel the particular part where the inflammation is; but they are ſure, from the ſymptoms, there muſt of neceſſity be ſome particular part inflamed; that this was all they ever aſſerted, for they never had undertaken to make you ſee, or the patient feel more acutely than uſual.

On ſuch occaſions thoſe gentlemen ſeem to forget, that however indolent and inſenſible certain parts of the human body may

be

be in a natural ſtate, inflammation never fails to rouſe and render them ſenſible; and although this were not the caſe, ſtill the ſeat of inflammation would probably be diſcovered by opening the body after death; but there are many inſtances of people dying of inflammatory fevers, whoſe bodies have been examined and diſſected by accurate anatomiſts, and no appearance of local inflammation found.

When fevers therefore diſplay every inflammatory ſymptom, while no part of the body can be perceived to be particularly affected, it ſeems highly reaſonable to believe, that the fever is not ſupported by any partial inflammation, but is diffuſed over the whole ſyſtem.

Inflammatory fevers occur at any ſeaſon of the year, and in any kind of weather; but they are moſt likely to be produced after a ſudden change from mild weather to froſt, or on a change of the wind from any other quarter to the north or north-eaſt.

The ſame ſudden changes are undoubtedly often followed by catarrhs, by the cynanche tonſillaris, or inflammation of the tonſils, by pleuriſies, and other diſeaſes of local inflammation; all which complaints have many ſymptoms in common with this fever, but are each of them diſtinguiſhed by peculiar ſymptoms. The pleuriſy, for example, occaſions coughing and painful reſpiration, the ſore throat, difficult deglutition, and ſo on.

When partial inflammation is not very conſiderable, or affecting an organ of great delicacy and importance, the action of the heart is not much augmented, and of courſe the feveriſh ſymptoms are but moderate, although there ſeems to be a great impetus of blood in the veſſels of the inflamed part.

But when the topical inflammation affects a vital organ, as the lungs; or when the inflammation is violent and extenſive in any part of the body, the heart itſelf is then ſtimulated to rapid and ſtrong exertions,

and

and the whole maſs of blood diſplays the ſame appearance as in the inflammatory fever.

After a perſon has been attacked with the uſual ſymptoms of the inflammatory fever, if he ſuddenly perceives a throbbing pain in a particular part, it is an indication that the diſeaſe is not what is ſtrictly called an inflammatory fever, but a local inflammation. Whether that is to be conſidered as a fortunate or unfortunate circumſtance, depends on the nature of the part that now ſeems peculiarly affected.

If there is an uncommon clammineſs of the mouth and throat, with a ſharp pain darting through one or both ears in ſwallowing, the diſeaſe will turn out an inflammatory ſore throat, and probably a ſuppuration of the tonſils will take place. Soon after the ſame feveriſh ſymptoms, if there comes a frequent dry cough, with oppreſſed breathing, and pain in one ſide, a pneumonic inflammation is threatened.

The firſt caſe might be reckoned a ſafe, the ſecond a dangerous exchange for an inflammatory fever.

Fevers entirely of an inflammatory nature are, I imagine, not very frequent any where; certainly thoſe of a mixed kind are moſt common in this iſland. Even thoſe which begin with every ſymptom of inflammation, and continue for ſome time with the ſame indications when prolonged beyond the uſual term, that is, beyond the ſecond week, without a favourable criſis, then diſcover ſymptoms which are conſidered as belonging more properly to the nervous fever; this circumſtance ſometimes gives riſe to diſputes of ſmall importance in themſelves, but which have been attended with diſagreeable conſequences.

A phyſician called at the beginning of a complaint, is aſked what is the patient's diſeaſe; perhaps he anſwers, an inflammatory

tory fever: Another called towards the end, when ſtupor and ſubſultus tendinum have taken place, being aſked the ſame queſtion, may very probably call the diſeaſe a nervous fever. They are both in the right; yet an impreſſion is left on the minds of the patient's relations, that one or other muſt have been in the wrong.

Names can have no influence on a judicious and experienced practitioner, who carefully examines ſymptoms, weighs every concomitant circumſtance, and forms his treatment accordingly. But there are practitioners who pay more regard to the name than to any other circumſtance of the diſeaſe: Only be ſo obliging as to furniſh them with that, and it is all the information they require; let it be inflammatory fever, nervous fever, hectic fever; be what it will, they conſult the laſt new practice of phyſic, and give you a preſcription directly.

I knew an inſtance of a phyſician who was called at the commencement of a fever, which he diſtinguiſhed by a name applicable to the ſymptoms which at that period of the diſeaſe were predominant, and he preſcribed accordingly; but not having it in his power to continue his attendance when the fever had changed its nature, the patient was put under the care of ſuch a practitioner as has been deſcribed above; who, among other circumſtances, being informed by the attendants of the name by which his predeceſſor, a man of ſome authority in the profeſſion, had diſtinguiſhed the diſeaſe, overlooking the alteration which had ſince taken place, this ſagacious Doctor fixed his attention upon the name only; and (as the firſt phyſician expreſſed himſelf in narrating the ſtory) having conſulted his oracle, had very near killed the patient by approved good preſcriptions.

I leave

I leave it to thoſe who have had the greateſt opportunities, to declare, whether they have not in the courſe of their experience met with caſes exceedingly ſimilar to this.

It was hinted in the preceding chapter, that there was good reaſon to believe that the true inflammatory fever takes place independent of marſh or human miaſmata; for when *they* co-operate, the fever is of a mixed nature, diſplaying at once ſymptoms of inflammation, of nervous debility, and greater tendency to remiſſion than is uſual in inflammatory fevers; and what renders this more probable is, that intermittent and malignant fevers, which we have ſuch ſtrong reaſon to be convinced proceed from theſe cauſes, generally happen in ſpite of all the care againſt cold and all the attention to regimen which the patient can take. Let him do as he pleaſes, if he lives in the neighbourhood of fens and marſhes, he will probably be ſeized with an ague; and let a

perſon be as guarded as poſſible in other reſpects, if he has any perſonal intercourſe with people in malignant fevers, he will be in great danger of catching one alſo; and very poſſibly the diſeaſe may come, in the one or the other caſe, when it is leaſt expected. Whereas the inflammatory fever, although more apt to come at one ſeaſon than another, when people are unguarded, yet ſeldom or ever, in any ſeaſon, attacks thoſe who avoid exceſſes in exerciſe and regimen, and are careful not to catch cold. So far from appearing when leaſt expected, we generally know and can point out ſome particular piece of imprudence or inattention, to which the inflammatory fever may reaſonably be imputed. But if it is obſtinately inſiſted upon that theſe miaſmata muſt have a ſhare in this fever, we ſhall only ſay, that when there is the ſtrongeſt reaſon to conclude that ſuch miaſmata do act in conjunction with cold, the effect is generally different; but, as was obſerved

on

on a former occaſion, it is difficult to prove that an inviſible ſubſtance is not preſent; however, according to Celſus, " has laten-" tium rerum conjecturas ad rem non per-" tinere, quia non interſit, quid morbum " faciat, ſed quid tollat."

The youthful, the ſanguine, and the active are moſt liable to this diſeaſe. The ſame elegant writer probably alludes to this when he ſays, " Si plenior aliquis, et ſpe-" cioſior, et coloratior factus eſt, ſuſpecta " habere bona ſua debet."

One reaſon for young and active people being more liable to this fever than perſons of more advanced age and leſs activity, no doubt is, becauſe the former are more prone, from imprudence and love of bodily exertions, to expoſe themſelves to the ſituations that bring it on.

It generally invades ſuddenly with a ſtrong cold fit, followed by thoſe ſymptoms which mark vigorous contractions of the heart,

heart, a ſtrong, rapid, full, and equal pulſe, exceſſive heat, a remarkable diminution of all the ſecretions, evinced by a dryneſs of the ſkin, tongue, throat, noſe, and bowels, great thirſt, loſs of appetite, with impairment of the ſmelling and taſte; the urine of a high red colour, ſcanty, and evacuated with heat; the face full and florid, with a redneſs of the eyes and averſion to light; pain and confuſion of the head; quick reſpiration, and ſometimes a dry cough; yet the patient does not diſplay much alarm about his own ſituation, nor that dejection of ſpirits which attends the nervous fever.

When he ſeems juſt ready to fall aſleep, or has actually begun to ſleep, he is apt to awake with a ſudden ſtarting. This ſymptom is alſo common in the eruptive fever of the ſmall-pox.

The abatements or remiſſions are not very evident, and always ſhort when they appear.

When

When this fever is very violent, and the ſymptoms not relieved in ſome degree by evacuations at the beginning, a high delirium enſues, the patient cannot be kept without difficulty in his bed, the pain and confuſion in the head riſes to frenzy, and he is ſometimes hurried off on the fifth or ſixth day.

The nervous fever generally is of longer duration than the inflammatory; yet in ſome very malignant caſes of the former, the patient is alſo carried off with ſymptoms of high delirium before the ſeventh day.

What diſtinguiſhes the two in ſuch violent caſes is, that in the inflammatory the pulſe is vigorous almoſt until the laſt, and the patient himſelf diſplays great bodily ſtrength in his ſtruggling; whereas in the nervous the pulſe is contracted and ſmall, and although the patient is exceeding reſtleſs, and ſtruggles alſo to get out of bed, yet his efforts are eaſily controuled.

But

But the moſt frequent termination of this fever is about the ſeventh, or before the end of the ninth day, and always before that of the fourteenth or fifteenth; for when prolonged after that time it totally changes its character, the phlogiſtic diatheſis is gone, it is no longer an inflammatory fever. The ſame ſymptoms which belong to the nervous fever then appear, and require the ſame treatment.

The obvious indications of cure in this diſeaſe are, to abate the violent action of the heart, which gives riſe to all the other ſymptoms, and relax the conſtriction of the veſſels on the ſurface of the body, which ſeems to ſupport and aggravate them.

Nothing has been diſcovered ſince the earlieſt medical records, which ſo effectually gives relief in all diſeaſes where the blood is too impetuouſly propelled, as diminiſhing its quantity. In doing this however, great attention muſt be paid to the degree of violence

violence of the diſeaſe, the ſex, age, and conſtitution of the patient.

From a ſtrong man of a ſanguine habit it may be expedient to take a pound of blood at once, and to repeat the operation, if the violence continues, in the ſame or in diminiſhed quantity, a ſecond or third time, at the diſtance of eighteen or twenty-four hours.

In plethoric patients the pulſe becomes ſometimes more free and even ſtronger after bleeding than it was before, by reſtoring that degree of elaſticity to the arteries which was impaired by too great fulneſs. The kind of oppreſſion of the pulſe which proceeds from plenitude, can eaſily be diſtinguiſhed by practitioners of attention and experience from that occaſioned by weakneſs.

As this is the moſt important thing that can be done in a pure inflammatory fever, it ought to be done at the beginning; for

after the third and fourth day it is thought not ſo proper, and is certainly not ſo effectual. If however the inflammatory ſymptoms continue with unabated violence, and if from the headach or oppreſſive breathing the brain or breaſt ſeem particularly threatened, thoſe circumſtances plead more ſtrongly for this evacuation at any period of the diſeaſe, than the hypothetical notion of interrupting coction, or any other conſideration, can do againſt it.

It may be thought ſuperfluous to add, that in caſe the firſt bleeding diminiſhes the ſtrength and fulneſs of the pulſe, and, of courſe, the violence of the other ſymptoms, a ſecond bleeding, and ſtill more a third, would be improper; and even although the pulſe ſhould afterwards ſeem to return to its former ſtate, the operation ought to be preſcribed with more caution, and if preſcribed, performed with more moderation than if the firſt bleeding had made no evident change; for what has happened is a proof

that

that the inflammatory diatheſis is not ſo obſtinate, nor is there ſo great a probability that it will continue throughout the diſeaſe as there was before that change happened.

I have had frequent occaſion to obſerve, in the early part of my life, that in hoſpitals, repeated bleedings are ſeldomer requiſite than elſewhere; for the effluvia of a number of ſick has a conſtant tendency to debilitate, and effect that change which is called putreſcent, however vigorous the patient's conſtitution is, and however inflammatory the diſeaſe for which he was brought into the hoſpital may be.

In fevers of the latter kind the heat is imputed to an augmentation of the *inteſtine*, not of the *progreſſive* motion of the blood; and therefore diminiſhing its quantity is not thought a means of abating it; but, without conſidering at preſent whether that conjecture is well founded or not, experience

rience proves that bleeding, which is indiſpenſable at the beginning of the inflammatory fever, does harm in the nervous.

On weighing the circumſtances that may determine the propriety or impropriety of repeated bleedings, the nature of the diſeaſes which prevail at the time ought to have conſiderable weight.

A perſon of a ſtrong plethoric habit may, in conſequence of expoſing himſelf to cold after being heated with violent exerciſe, or of ſome other piece of imprudence, be ſeized with every ſymptom of an inflammatory fever, at a time when putrid diſeaſes are epidemic. In this caſe it may be highly requiſite that he ſhould loſe ſome blood; but in prudence he ought to loſe leſs than if inflammatory complaints were at that time the reigning diſeaſes.

For although the violent cauſe which brought on the diſeaſe has force to overcome every thing which oppoſes it in ſtamping the character of the fever, yet the

the qualities and diſpoſition of the atmoſphere will afterwards gradually operate in changing its nature to that of the prevailing epidemics.

As a viſcid ſcum of a whitiſh or buff colour is generally obſerved to form on the blood as it cools, ſoon after being drawn out of the body, in all inflammatory diſeaſes, this buff was ſuppoſed to point out the degree of inflammation, and was conſidered as a ſtrong proof that inflammation in general proceeded from a viſcidity or lentor in the blood.

But this phenomenon being now accounted for in a different and more ſatisfactory manner, can no longer give any aid to the hypotheſis it was formerly brought to ſupport; yet although it cannot now be allowed to ariſe from viſcidity in the blood, it is ſtill a proof that inflammatory diſeaſes do produce ſuch a change in this fluid as determines its conſtituent parts to

arrange themſelves and ſettle in a different manner from what they do in perfect health and in other diſeaſes; and as this propenſity in the blood ſeems to increaſe with thoſe inflammatory complaints, the thickneſs of this buff, in many caſes, may ſtill be conſidered as an index, though but an uncertain one, of the degree of inflammation.

What renders it ſtill more uncertain is, that it depends in ſome degree on the rapidity or ſlowneſs with which the blood flows from the vein. When it ruſhes in a free ſtream without touching the arm, the ſame blood will ſhew a greater thickneſs of buff, than if it falls languidly, drop by drop, down the arm.

And alſo becauſe the blood of pregnant women, though otherwiſe in perfect health, ſhews the ſame kind of buff on the ſurface as that of people in fevers, pleuriſies, and other inflammatory diſeaſes; and ſometimes this ſizy pellicle is found on the blood

blood of patients even in the nervous fever. But when the inflammatory diatheſis prevails ſtrongly, the cruſt upon the ſurface is generally found to adhere more tenaciouſly to the craſſamentum beneath, than when the inflammatory diſpoſition is weaker, or when the oppoſite diatheſis prevails; and in the latter caſe, what cruſt there is, does not appear of ſuch a decided buff colour, but ſeems rather of a greeniſh colour, owing to the craſſamentum ſhining through it becauſe of its thinneſs.

After diminiſhing the quantity of blood, what has the moſt immediate tendency to give relief in this diſeaſe, is to cleanſe the inteſtinal canal. Clyſters alone are not ſufficient for this purpoſe, as they often do no more than empty the rectum, leaving much impure matter in the higher bowels.

It is therefore highly expedient ſoon after bleeding, to give ſuch a purgative as will effectually empty the whole courſe of

canal, and at once remove the irritation of indurated fæces and pent-up humours, prevent acrimonious abſorptions, drain the arteries and other veſſels which pour their excretions into the cavity of the inteſtines, and by this evacuation weaken the too violent contractions of the heart and impetuoſity of the circulation; in other words, abate the fever.

The propereſt purgatives for anſwering all thoſe intentions are thoſe whoſe cooling and deobſtruent nature enables them to waſh away the contents of the bowels effectually, without occaſioning gripings, or otherwiſe ſtimulating the ſyſtem. The materia medica furniſhes an ample variety of ſuch. What in my opinion is equal if not ſuperior to any other, is a ſolution of ſal catharticus glauberi, or ſal rupellenſis, in water, or in a decoction of tamarinds: to thoſe whoſe ſtomachs cannot bear the ſaline purgative given alone, the milder

vegetable purgatives, of which rhubarb and ſena are the beſt, may be given either alone, or combined with ſal polychreſtus, cremor tartari, or tartarum ſolubile.

After the cavity of the inteſtines is entirely emptied by a purgative at the beginning, emollient clyſters, adminiſtered at proper intervals, will be ſufficient to prevent coſtiveneſs through the courſe of the diſeaſe. They are alſo ſuppoſed to promote urine, and to act as fomentations.

Vomits can ſeldom be proper in this fever; let us recollect the ſymptoms, a hard, full, and impetuous pulſe, burning heat, a ſwelled glowing face, the veſſels of the eyes turgid with red blood; in ſuch a ſtate of the body, when the veſſels ſeem ready of themſelves to burſt with plenitude and rapid circulation, to excite the violent exertion of vomiting might be highly dangerous. Antimonials, however, given in ſuch ſmall doſes as do

not occaſion vomiting, are often of great ſervice, by promoting perſpiration, and gently moving the bowels, ſo as to render other laxatives unneceſſary. In this way they very often contribute to abate the force of, or entirely to throw off the fever; and none operate more gently and more effectually than Dr. James's powder given in ſmall doſes.

As the moſt diſtinguiſhing features of this fever ſeem to depend on the violent action of the vaſcular ſyſtem, whatever contributes to ſtimulate muſt do harm. The impreſſions made by noiſe, light, external heat, and thirſt, are all of this kind. In preventing and removing them we follow *the impulſe of nature*, which inclines the patient to ſtillneſs, to darkneſs, to a cool well-ventilated chamber, and the conſtant uſe of acidulated drinks.

The excluſion of light and of noiſe was always conſidered as expedient in fevers; but

but it is only a late practice in this iſland to indulge the patient in breathing a cool air, and in being freed from an oppreſſive load of bed-clothes. Yet this is ſo obvious and ſo natural a way of giving relief to thoſe who ſuffer from heat, that nothing could have prevented its being univerſally adopted, but ſome deeply-rooted prejudice or erroneous theory reſpecting the nature of fever, and the neceſſity of forcing ſweats. That theſe opinions were not founded on fair experience is now evident, from the comfort and benefit found to flow from allowing the patient's bed-chamber to be frequently refreſhed with ſtreams of cool air, by ſprinkling it with vinegar, by keeping it always unencumbered with the perſons and unheated by the reſpiration of too many people, and by relieving his body from oppreſſive covering.

It is of ſervice alſo to waſh the hands and face of the patient from time to time with

tepid water and vinegar, which may be done more conveniently in a ſitting than in a horizontal poſture. To be ſeated in an eaſy chair for a conſiderable part of the day, inſtead of laying in bed, is peculiarly proper when the head is much affected, and a delirium is threatened; becauſe, in an erect poſture, the blood moving contrary to its own gravity, its motion is retarded, and its impulſe upon the brain diminiſhed.

Shaving the head, waſhing it frequently with vinegar, and keeping it thinly covered, are always refreſhing, and ſometimes give conſiderable relief.

Beſides abating the uneaſy and irritating ſenſation of thirſt, indulging the patient to the height of his deſire in proper drinks is alſo of ſervice, by diluting and cooling the overheated blood and juices.

Theſe drinks ſhould be varied and adapted to the varying taſte of the patient; pure water, barley water, ſeltzer water, lemonade, imperial,

imperial, rennet, orange, lemon, or ſorrel wheys, raſberry or currant jelly diſſolved in water, apple tea, balm tea acidulated with lemon juice, and other combinations, may be given with propriety; and he ſhould not only be allowed but even prompted to drink them in conſiderable quantities; for thoſe cooling and mild ſubacid drinks not only quench and dilute, but alſo afford materials for free perſpiration, and contribute to remove the conſtriction of the veſſels. The manner in which they contribute to this is diſputed. Some think it is by *dilatation*, as the liquors paſs through the excretories of the veſſels; but to this it is objected, "that the obſtruction muſt have al-" ready been removed before they *can* " paſs;"—to which thoſe who ſupport the idea of dilatation reply, "that the contraction " is never ſo great as to prevent perſpira-" tion altogether, but only to diminiſh it: " that thin diluting liquors received into " the blood, tend, in the courſe of circula-

" tion,

" tion, to the extreme veſſels, and by an uni-
" form and gentle preſſure, ſwell the larger
" veſſels, and ſo gradually dilate and remove
" the contraction of the ſmaller."

This mechanical method ſeems improbable to others, who explain the effect of the liquors in tending to remove the ſpaſm, by the ſympathy and connection between the ſtomach and ſkin, which they ſupport by various illuſtrations; this in particular: " A draught of cold water," ſay they, " is " often a pleaſant and effectual means of " producing ſweat; and it has that effect " long before it can be ſuppoſed to have " entered the circulation, and have been " determined to the ſkin."

The material thing to know is, that thoſe cooling drinks do certainly promote perſpiration, and abate the fever; the means by which they do it, if leſs certain, are alſo leſs important.

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The tepid bath has often been recommended in this fever, upon the ſuppoſition that it muſt be of ſervice in promoting the relaxation of the veſſels on the ſurface, which ſeems ſo much required; and when, on account of the difficulty of moving the patient, the entire bath cannot be uſed, ſteeping and fomenting the legs, thighs, and belly, with flannel cloths wrung after being dipped in warm water, or applying large bladders filled with warm water to the patient's body, have been recommended as ſubſtitutes to the bath: But the pulſe is ſo vehement, and the ſkin ſo hot in this fever, that any additional heat ſeems dreadful to the patient; and it is almoſt impoſſible to uſe the bath or theſe fomentations, without doing more harm, by fatiguing and heating the patient, and ſtimulating the heart to more rapid contractions; than ſervice, by the relaxation they are expected to produce.

Keeping

Keeping the patient's body lightly covered, and admitting a cool ſtream of freſh air to paſs from time to time through the bed-chamber, is a more probable means of abating the violence of the fever than ſuch fomentations, whoſe inconveniencies are inſtantaneous, and whoſe benefit is uncertain.

With regard to diet very little needs be ſaid; Nature herſelf generally takes care that no error ſhall be committed during the continuance of this diſeaſe in that article; even when injudiciouſly urged, the patient ſeldom is perſuaded to ſwallow any thing but drink: If by accident he ſhould have an inclination for ſomething more ſolid, panado, roaſted apple, a few grapes, or ſome other mild ripe fruit, is all that ſhould be allowed.

The moſt important relief that art can afford in this fever, proceeds undoubtedly from the evacuations of bleeding and purging

ging at the beginning, the continued uſe of cooling diluting drinks, with antimonial alteratives; all the good effects expected from theſe however, will be promoted by the aperient, quenching, refrigerating, and diaphoretic qualities of ſome of the neutral ſalts, particularly of nitre; as much of this ſalt therefore as is thought requiſite, may be diſſolved in the patient's drinks.

One inconvenience ſometimes attends the uſe of this medicine in due quantities, which is its ſitting uneaſy on the ſtomach. This effect will be prevented in ſome conſtitutions, by combining the nitre with the ſaline draughts of Riverius, inſtead of mixing it with the patient's drinks; fifteen or twenty grains of the former may be added to each of the latter, and given every four or every ſix hours: But if the nitre ſtill ſeems to give uneaſineſs, Riverius's draught, which is equally agreeable to the taſte and ſtomach, may be given alone, and repeated every two or three hours.

This

This fever ſometimes is entirely carried off by a ſmall hemorrhage at the noſe, and often yields to the evacuations uſed at the beginning; if neither happen, but yet the ſymptoms ſeem conſiderably checked, and their violence abated, in all probability a favourable criſis by ſweat may be looked for about the end of the firſt week; but whether it ſhould take place then, or at ſome future period, the following ſymptoms announce the abatement of the fever: The pulſe becoming ſofter and ſlower, the headach and thirſt abating, the urine increaſing in quantity, and moiſture returning to the noſe and mouth. Soon after theſe flattering appearances an univerſal ſweat breaks forth, the urine depoſits a light reddiſh or a white ſediment, the patient gets ſome refreſhing ſleep, and the pulſe becomes moderate, the fever is gone, and the patient requires nothing but a gradual return to nouriſhing diet to reſtore his former health.

III.

THE REMITTENT OR MIXED FEVER.

HAVING endeavoured to deſcribe the ſymptoms, and detail the method of cure in what is, ſtrictly ſpeaking, called the inflammatory fever, before I proceed to that in which the ſymptoms are of a nature directly oppoſite, I ſhall give the beſt idea I can of a fever much more common than either, in which the ſymptoms which proceed from an over-violent action of the heart, are blended with thoſe which ſeem to proceed from marſh or human miaſmata, and which indicate a direct affection of the brain and nerves.

One reaſon for preferring this order is, that when the diatheſis which reigns during

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the former, and which appears at the beginning of this mixed fever, is ſubdued by the continuation of either diſeaſe, they then entirely aſſume the ſame ſymptoms and appearance which occur in the nervous fever, and are to be treated in the ſame manner.

In enumerating the remote cauſes of fevers, a ſtoppage of the perſpiration by expoſingthe body to c old, was aſſigned as the uſual cauſe of the inflammatory fever, and this not from any reaſoning *à priori* on the nature of cold, or the probable effects it might produce by ſhutting up the perſpirable matter or otherwiſe, but merely becauſe we ſee that inflammatory diſeaſes of various kinds, and fevers in particular, often occur after the body has been ſo expoſed, and when we know of no other cauſe to produce them.

In like manner we conclude, that the vapour ariſing from ſtagnating water and putrefying

putrefying vegetable and animal ſubſtances, being abſorbed by or applied to the human body, produces intermittents; but we form this concluſion from no philoſophical deduction drawn from an inveſtigation of the nature of the vapour, but ſimply becauſe intermittents are moſt frequent in low and marſhy countries, where this vapour moſt abounds.

And having obſerved that a ſtill more malignant fever often ariſes in places where men are greatly crowded together, we infer that the effluvia or miaſmata of the human body produce the nervous malignant fever.

But although no human genius or inveſtigation would diſcover, *à priori*, that cold produces inflammatory fevers, the vapour of marſhes intermittents, or the human miaſmata nervous fevers; yet when we have ſo much reaſon to think that this is really the caſe, a very moderate capacity would ſuſpect that thoſe cauſes acting in

conjunction, would produce a diſeaſe complicated with the ſymptoms of all the genera. It would not be unnatural even to proceed to other concluſions, ſuch as, that this mixed fever would be moſt prevalent, when an uncommonly cold and moiſt autumn ſucceeded an uncommonly hot ſummer; that in the winter and ſpring the inflammatory ſymptoms would be ſtronger than in the ſummer or autumn; that it would be more ſevere in fleets and armies during campaigns, becauſe ſailors and ſoldiers are then more expoſed than other men to the influence of all the three cauſes; that in armies the foot ſoldier would be more liable to the diſeaſe than the dragoon, the private centinel than the officer; that the ſymptoms would vary in different countries, according to the degrees of heat, cold, and moiſture; that in barracks and in hoſpitals the nervous ſymptoms would preponderate, and in the field the inflamma-

tory;

tory; and finally, that the various conſtitutions on which this diſeaſe might be engrafted would contribute to form various ſhades and differences in the ſymptoms.

All thoſe inferences, which ſeem ſo obvious, are confirmed by experience.

This mixed fever is deſcribed under various names by different authors, particularly under thoſe of bilious fever, remitting fever, autumnal fever; which deſcriptions, when attentively conſidered, are found to imply a diſeaſe eſſentially the ſame; but wherein particular ſymptoms predominate in one caſe, and others in another, in conſequence of the ſtate of the weather, the conſtitution of the patient, and the place in which he reſides at the time he labours under the complaint. Perhaps all the above names might be objected to on good grounds: *Bilious* may be ſaid to be improper, becauſe the ſymptom which gives riſe to the name does not always attend the diſ-

eaſe; *remitting* may be objected to, as not ſufficiently diſtinguiſhing, becauſe all fevers remit in ſome degree; and *autumnal* may be thought equally open to criticiſm, becauſe the diſeaſe occurs alſo in other ſeaſons.

Whichſoever of thoſe names I may occaſionally uſe in treating of this mixed fever, I ſhall always mean the ſame diſeaſe, although I may apply that name which I think beſt adapted to the ſymptom under conſideration at the time.

The mixed fever uſually begins with a feeling of wearineſs, a frequent inclination to yawn, an irregular ſenſation of cold, approaching to chillineſs, a confuſed pain in the head, nauſea, thirſt, and very often vomiting.

It ſeldom attacks ſo briſkly or ſuddenly as the inflammatory fever. The pulſe though hard and quick, is not ſo ſtrong, full, and equal; neither is the heat ſo great nor ſo uniform; the remiſſions are more evident

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and permanent; and when they appear, there is a moiſture on the ſkin, which ſeldom is found at the beginning of the true inflammatory fever. The nauſea in this fever is greater than in the inflammatory, and more apt to produce bilious vomitings, which are generally preceded by a pain about the pit of the ſtomach. In the inflammatory fever the tongue is dry; in the remitting fever it is covered from the beginnig with a whitiſh moiſt mucus, which gradually, as the fever advances, becomes dry and of a brown colour.

The ſymptoms both of the inflammatory and the mixed fever augment in the night; but in the latter there is a remiſſion attended with ſweat towards morning; after an abatement of a few hours the ſame ſymptoms return, but are ſeldom introduced any more by a ſenſe of cold or chilline ſs.

In this manner the fever ſometimes continues, with acceſſions towards night, and

remiſſions in the morning for ſeveral days; the former however gradually gaining ground, till at length the latter are hardly perceptible.

There are inſtances of this fever attacking in a much more violent manner, the patient complaining of acute headach, thirſt, exceſſive heat, and the fever increaſing within a few hours after his being firſt ſeized, to a high and frantic delirium. I have ſeen many caſes of this kind in Dutch Brabant; for this laſt ſymptom ſeldom or never happens in the remitting fever, except in hot climates, or if in a moderate climate, in the moiſt, low, and marſhy countries, at the hotteſt ſeaſon of the year, and to thoſe who from neceſſity or imprudence have uſed ſevere exerciſe in the midſt of fogs, or during the ardour of the ſun.

Sir John Pringle gives inſtances of ſuch violent caſes; they happened in the flatteſt

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and moſt foggy country in Europe, in the neighbourhood of Bois-le-duc, to ſoldiers obliged to uſe hard exerciſe on the duty of foraging, while the adjacent plains were inundated*.

But in all thoſe caſes the influence of marſh miaſmata formed an eſſential difference between them and the inflammatory fever, ariſing alſo from violent exerciſe, but uſed in countries free from all ſuch miaſmata, as is hinted in the foregoing chapter on fevers in general, and alſo in that on inflammatory fevers†; for in the former, notwithſtanding the ſuddenneſs of the attack and the high outrageous delirium, after a few returns of ſuch paroxyſms, there are ſo great ſigns of debility as to occaſion fainting, when the patient is raiſed from a recumbent to an erect poſture.

* Vide Pringle's Obſervations, &c. 7th edition, page 75—78.

† Vide page 309 and page 343.

The patient is alſo generally troubled with much nauſea and retching, and the delirium goes off in a few hours with profuſe ſweat, in ſome caſes returning next day, and remitting in the ſame manner; none of which circumſtances occur in the unmixed inflammatory fever, when it attacks in the ſame violent manner with high delirium.

But ſuch violent caſes are rare, this mixed fever uſually beginning with milder ſymptoms, irregular chilline ſs, laſſitude, confuſion of the head, aching of the bones, and diſorder of the ſtomach.

If the ſtrength and hardneſs of the pulſe induce the phyſician to order bleeding, the blood generally throws up abundance of inflammatory cruſt, notwithſtanding which, inſtead of greater and more diſtinct remiſſions, which he probably expects from the evacuation, a ſudden and dangerous degree of weakneſs not unfrequently follows; for

for in the progreſs of this fever the pulſe is not ſo ſteady as in the inflammatory.

This diſeaſe is ſometimes accompanied at the beginning with coſtiveneſs, at other times with a tendency to looſeneſs; the firſt caſe forms a preſumption of an inflammatory bias in the diſeaſe.

Exceſſive ſickneſs, bilious vomiting and purging, are often the predominant ſymptoms at the beginning of this fever; and when theſe evacuations are judiciouſly encouraged and aſſiſted by repeated draughts of mild ſubacid drinks, and plentiful dilution continued for ſome time after the evacuations have abated, this treatment alone frequently carries off the fever;—in my opinion it performs this ſervice oftener than it gets the credit of it.

For as the cholera, a diſeaſe conſiſting of alternate vomiting and purging of bilious matter, is not uncommon at the time of the year

year when this fever is moſt apt to prevail; when the fever is accompanied with bilious vomitings and purgings, and is actually cured by encouraging theſe evacuations, it is ſometimes imagined that the whole of the diſeaſe was a cholera, although in reality a formed fever had commenced, of which the vomiting and purging were only ſymptoms.

It may be ſaid that it is impoſſible to know that a diſeaſe, which ſuddenly retires, would ever have advanced; and the cholera is a diſeaſe which frequently occurs, independent of any formed fever.

But as the cholera often occurs without fever, when a perſon is ſeized with a cold fit, followed by heat and other ſymptoms of fever, although bilious vomiting and purging ſhould accompany or follow theſe feveriſh ſymptoms, the diſeaſe ſhould be conſidered as a fever, and not a cholera.

Beſides, when this fever is epidemic, we ſee frequent inſtances of its beginning with vomiting

vomiting and purging; but the patient refuſing to encourage, by any means, thoſe evacuations, they ſtop of themſelves, in which caſe the fever generally continues with great ſickneſs and oppreſſion through the remaining courſe of the diſeaſe: Whereas when the patient has the reſolution to perſevere, in ſpite of nauſea and ſickneſs, in drinking abundantly of mild diluent liquors, and alſo allows them to be injected by the anus, till the redundant and acrimonious bile is intirely waſhed from the alimentary canal, the feveriſh ſymptoms are more apt to ceaſe along with the vomiting and the purging, the whole diſorder terminating in a profuſe and univerſal perſpiration.

Chillineſs, headach, and every indication of a beginning fever, had accompanied the vomiting and purging in the laſt caſe as in the firſt, and there was the ſame reaſon to dread the continuation of it in both inſtances. Since, therefore, it ſeldomer continues

tinues when thoſe evacuations are freely promoted than when they are not, it ſeems highly probable that promoting them by plentiful dilution, is not only the propereſt treatment of a cholera, but alſo a likely means of carrying off a fever which begins with the ſymptoms of a cholera.

And although this method does not ſucceed in removing every fever that begins with thoſe ſymptoms, there is the greateſt reaſon to believe that it is always of ſervice, and alleviates or prevents many troubleſome ſymptoms in the courſe of the fever.

The good effects which antimonial medicines, given at the beginning of this fever, often produce, render this ſtill more probable; the vomiting, purging, and perſpiration which they excite (for it is when they excite all the three that they are moſt ſucceſsful), often having the ſame efficacy in removing this fever when it begins without

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thoſe ſymptoms, that promoting them by continued dilution has when the fever ſets in with them.

When the ſymptoms of a ſuperabundance of bile appear from the commencement of this fever, there is a great probability that the patient will be peculiarly ſubject to ſickneſs, oppreſſion, drought, bilious ſtools, with ſwelling and tenſion of the belly through the courſe of it.

Thoſe painful and diſagreeable ſymptoms ſometimes take place, notwithſtanding all the care that can be taken to promote the evacuation of bile from the beginning, but are apt to be more ſevere, to be attended with gripes, with heat, and ſometimes even with excoriation about the fundament, when this is neglected.

Worms are ſometimes paſſed by ſtool, ſometimes they are thrown up by vomiting

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in the courſe of this fever, and ſometimes eſcape by the mouth without vomiting, and in ſuch caſes the griping and ſickneſs are remarkably obſtinate and ſevere.

Lanciſius firſt gave an opinion, which has been ſince adopted by Sir John Pringle and Dr. Donald Monro, in their books upon the diſeaſes of the army, that as theſe animals ſometimes lie long in the bowels without creating much uneaſineſs to perſons otherwiſe well, he ſuppoſes that in all who have this ſymptom, the worms are lodged before the fever begins; and then being annoyed by the increaſe of heat, and the corruption of the humours in the primæ viæ (conſequent on the fever), they begin to move about and ſtruggle to get out, and ſo occaſion the diſagreeable ſymptoms above mentioned.

Notwithſtanding the reſpectable authority by which this opinion is ſupported, I cannot

not help thinking it more probable that theſe animals are produced by the effects of the fever, than that they exiſt previouſly; and that being ſeduced and perverted from their original *ſtate of innocence* by the *corruption* of the diſeaſe, they then, for the firſt time, become miſchievous wanderers all over the alimentary canal: Which opinion is greatly confirmed by this circumſtance, that worms are very ſeldom found in the bowels of grown-up perſons who die of other diſeaſes.

The urine is generally high-coloured and tranſparent, and rendered in ſmall quantity at the beginning of this fever; in the progreſs of the diſeaſe it aſſumes a citron colour, or becomes turbid; if the diſeaſe takes a favourable turn, it is made in conſiderably greater quantity, and ſometimes (not always) depoſits a pale brick-coloured ſediment.

The duration of this fever, like that of all fevers, is uncertain; as I am convinced that it is ſometimes checked and ſometimes intirely removed by aſſiſting ſpontaneous or exciting artificial evacuations on its firſt appearance; I am alſo convinced that its courſe may be ſhortened by other means which may be uſed during its progreſs: I therefore cannot be ſurpriſed at that uncertainty.

As for the ancient and venerable doctrine of critical days, without calling in queſtion the veracity or judgment of thoſe great men, who in other climates, when the mode of living was more ſimple, and at a period when the practice of medicine was more paſſive than it is at preſent, firſt pointed them out; I have only to ſay, that what obſervations I have been able myſelf to make, have not taught me to rely upon them.

I therefore look up with admiration at the ſuperior penetration of thoſe *who* inform us, that they can perceive them take place with wonderful regularity even in this uncertain climate, and in theſe days of luxury and exceſs, and notwithſtanding the *various* methods of treating fevers now in uſe. For even admitting that Nature of herſelf had a deſire of terminating a fever on one day rather than another, and that a few ſaline draughts, caſtor boluſes, or a little cordial confection, could not much diſturb the natural courſe of things, yet it ſeems reaſonable to expect that ſuch powerful medicines as antimony and Peruvian bark would make a great alteration in the progreſs and periods of the fever, and put it out of the reach of every eye but that of faith, to diſcern the critical movements in queſtion. To ſuppoſe that theſe medicines will abridge the fever, without diſconcerting the critical periods, is to ſuppoſe a great deal.

If it is difficult to point out a regular plan of treatment in diſeaſes whoſe appearance is more uniform, it muſt be ſtill more difficult in ſuch a diſtemper as this, whoſe remiſſions announce it of a middle nature between the continued and remittent fever, while another combination of ſymptoms incline us to think it alſo of an intermediate kind between the inflammatory and the nervous; and whoſe Proteus diſpoſition, after diſplaying the ſtrongeſt likeneſs to the former, is apt ſuddenly to aſſume the moſt malignant features of the latter. As bleeding is ſo beneficial in the one and ſo hurtful in the other, one of the firſt and moſt important points to be decided in our treatment of this mixed fever, is, in what *degree* that evacuation is proper, and in what caſes it is proper at all.

We find a very great difference of opinion among medical writers on this important head; and there are ſome who firſt

inſiſt at great length upon the neceſſity of repeated bleedings at the beginning, when the pulſe is ſtrong and frequent, warn us, in pathetic terms, of the danger of delay; becauſe the opportunity of doing good by that evacuation, if neglected, will never return; and in a ſubſequent paragraph the prudent author informs us, that however ſtrong the phlogiſtic diatheſis appears to be at the commencement of fevers, yet, in many inſtances, it does not form the eſſential part of the diſeaſe, and will not continue through the courſe of it. We are reminded, that "to diminiſh the quantity "of blood is an eaſy affair, but to reſtore "that ſource of ſtrength is tedious and "difficult, and intreated to be upon our "guard, for perhaps nervous debility and "putreſcency are lurking behind the in-"flammatory ſymptoms, ready to ſtart "forth and raviſh the patient out of our "hands as ſoon as he has loſt a little "blood."

Such admonitions are no doubt well meant, and deſerve our gratitude, as much as the commander in chief did that of the officer whom he detached upon a hazardous expedition, with preſſing orders to haſten his march and attack the enemy as ſoon as poſſible, taking care at the ſame time not to *precipitate* things in the leaſt, but to *wait patiently* for a proper opportunity; as the enemy, on their part, were extremely well diſpoſed to deſtroy him and his whole party if they could. Admonitions to avoid the dangers by which we ſeem equally preſſed, of bleeding or letting it alone, are of little ſervice unleſs they are accompanied with ſuch particular directions as may aſſiſt our judgment in determining on the one meaſure or the other.

The ſtate of the weather and ſeaſon of the year will aſſiſt a little in deciding this point, becauſe the nature of the fever will more probably incline to what is called the putrid kind in autumn after a very hot ſum-

mer, than during the froſts of winter or the piercing winds of the ſpring. Bleeding therefore will more probably be requiſite in the one ſeaſon than in the other, and may be ventured in greater quantity, although the ſymptoms ſhould be nearly the ſame.

When the patient is coſtive there is more reaſon to believe the fever to be of an inflammatory nature than when his body is looſe.

When diſeaſes of a nervous malignant tendency prevail, or has lately viſited a perſon in a fever of that ſpecies, or when the patient is lodged in an hoſpital, we ought to be more cautious of bleeding at all, and more moderate in the quantity to be taken, than if no ſuch diſtempers were epidemic, or than if the patient had not had any intercourſe with a perſon from whom he could receive the contagion, or than if he breathed an atmoſphere more free from human effluvia than is to be found in hoſpitals.

The ſame caution and moderation is more requiſite with patients whoſe natural conſtitution is weakly, than with thoſe who are robuſt and plethoric.

Due weight being allowed to all theſe circumſtances, we ſhall be enabled to determine with ſtill more accuracy upon the propriety of veneſection, by attentively conſidering the ſymptoms themſelves; and when we find thoſe which indicate the operation blended with thoſe which forbid it, our deciſion will depend upon which preponderate.

Should a robuſt man, for example, complain of a ſenſation of cold, with irregular ſhiverings, ſucceeded by great heat, a ſtrong and rapid pulſe, with pains in the loins and head, and is at the ſame time coſtive, it will be expedient to let ſome blood previous to giving an emetic or uſing any medicine, although the diſeaſe occurs in autumn, and the patient has a yelloviſh tinge

tinge in his eyes, a bitter taſte in his mouth, and much nauſea. But if the cold fit is preceded by long continued liſtleſſneſs, if it amounts only to a feeble ſenſe of cold or irregular chillneſs, if attended with an open belly, and if the patient ſeems dejected, it will be beſt to wave the bleeding, although the ſkin ſhould be very hot and the pulſe pretty full and ſtrong.

The two circumſtances which deſerve to have the greateſt weight in deciding this queſtion, are the nature of the prevailing epidemic, if any prevails, and the conſtitution of the patient; for if the laſt is not exceedingly ſtrong and plethoric indeed, and the pulſe ſtrong and full in proportion, it will be ſafeſt to omit bleeding when nervous malignant fevers are frequent in the neighbourhood. But if the ſtrength of the patient and the ſymptoms of inflammation determine us to riſk this evacuation, it ſhould be in a much more moderate degree than

we might have thought expedient, had no ſuch epidemics reigned at the time.

After all the accuracy that can be diſplayed in pointing out the proper treatment in this important article, caſes occur that puzzle phyſicians of the greateſt natural ſagacity and moſt improved experience—and perhaps puzzle thoſe of this deſcription only; for there are to whom no extenſion of practice can give experience, and to whoſe ſelf-ſufficiency, no caſe, however complicated with oppoſing ſymptoms, ſeems intricate.

After bleeding, or having decided that the evacuation is not neceſſary, the meaſure to be taken in the next place admits of no doubt. The ſtomach and whole length of the alimentary canal ſhould be emptied.

The remains of food, the redundancy of bile and other ſecretions, with the wind and fæces there accumulated, have doubtleſs conſiderable effect in aggravating every ſymptom

ſymptom at the beginning of the fever, and we ſometimes have the ſatisfaction of finding the fever entirely removed in conſequence of the means taken to cleanſe the firſt paſſages.

If there is a conſiderable degree of nauſea, it will be to no purpoſe to begin with a purgative; becauſe in this ſituation the patient would in all probability throw it up. It will be beſt therefore to begin by ordering a laxative clyſter; and after the operation of that medicine is over, to give an emetic.

The firſt will waſh the hardened fæces from the rectum, and render the operation of the ſecond more effectual. It will be beſt not to give the emetic at the time of the acceſſion; but rather wait till that ſeems to abate.

Two or three grains of tartar emetic diſſolved in a little water will generally prove a ſufficient doſe, and in this fever is more efficacious

efficacious than ipecacoanha, which in the dyſentery is preferable to tartar emetic. The vomiting, when it begins, muſt be promoted by drinking very plentifully of warm water; and in caſe the firſt doſe ſhould not operate within half an hour after it is taken, three grains more may be diſſolved in a quart of warm water; and half a pint of this ſolution may be drank every quarter of an hour till it has had the deſired effect.

Exhibited in this manner, the antimonial generally proves both emetic and purgative, effectually cleanſing the whole inteſtinal canal, and often producing ſuch a determination to the ſurface as brings on an univerſal diaphoreſis, and removes the conſtriction of the extreme veſſels, all of which effects united, ſometimes carry off the fever.

As there is reaſon to think that much acrimonious bile is ſometimes accumulated in the gall-bladder and flexure of the duodenum, and much rancid matter retained

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in the bowels at the beginning of this fever, it follows of courſe that ſuch accumulations muſt aggravate every ſymptom of the fever; and it cannot be doubted that throwing ſuch a load out of the body muſt have conſiderable effect in cooling and relieving the oppreſſed patient; but then it is urged, that this redundancy and accumulation of bile and other acrimonious matter being the effect and not the cauſe of the fever, the removal of it, although it do produce an abatement of the ſymptoms, cannot poſſibly remove the fever.

However plauſible this may ſeem, I am fully convinced from obſervation, that vomits, and particularly thoſe of emetic tartar, are often of great ſervice, independent of their effect of unloading the ſtomach, ſometimes even when the ſtomach ſeems to have been quite clean, and when nothing has been thrown up beſides the emetic itſelf and the water.

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The action of vomiting is violent and convulsive; the retchings, which continue after the stomach itself is quite empty, are still more so: They produce a copious and universal perspiration; they affect every vessel of the body; the stomach has a stronger sympathy than any other organ, the heart excepted, with the whole body; and I have not a doubt that emetic tartar, exhibited in the manner above mentioned, sometimes entirely shakes off fevers. I shall not make any farther attempt to explain *how;* such an attempt would be as superfluous as it might be unsuccessful; for those who expect nothing from this medicine but cleansing the first passages, and preventing noxious absorption, may think the antimonial necessary for those purposes at least; and if, upon trial, they find that it has another salutary effect besides that which they expected, the good resulting to the patient will be deemed, it is to be hoped, a sufficient compensation for the refutation of their argument.

If at the beginning of the fever the patient has a violent vomiting, it will not be proper to give either tartar emetic or ipecacoanha, but rather to promote the ſpontaneous vomiting by plentiful and repeated draughts of warm water, until the ſtomach is completely cleanſed, and the vomiting ceaſes; for vomiting is the cure of vomiting in all caſes except when it proceeds from an inflammation, or ſome other diſeaſe of the *ſubſtance* of the ſtomach.

When the vomiting is accompanied with a purging, as is often the caſe, plentiful drinking, without any cathartic medicine, will be ſufficient to promote this evacuation as well as the other; but if there is no natural looſeneſs, or if the tartar emetic, the ipecacoanha, James's powder, or whatever may have been given to excite vomiting, operates as a vomit only, without emptying the bowels alſo, it will be highly expedient to give the patient an injection a ſhort time after

after the operation of the emetic, and a cooling purgative the following day.

But if at the beginning of the fever there is neither a vomiting nor a great degree of nauſea, it will be moſt expedient to give, previous to the emetic, and immediately after the bleeding (if bleeding is at all neceſſary), a medicine that we are certain will *directly* prove cathartic; for it is of great importance to cleanſe the *whole* alimentary canal and prevent acrid abſorptions as ſoon as we poſſibly can; and in this caſe the tartar emetic may be given the day after the operation of this purgative.

In ſhort, the firſt thing to be done on the attack of the fever, is to bleed, if bleeding be thought proper; after which, in caſe of ſickneſs or much nauſea, to give an emetic, and if this emetic does not prove alſo purgative, an injection ſhould be given the ſame evening to remove indurated fæces, and a cooling purgative next day to cleanſe the

the whole canal; but when there is little or no nauſea, or other ſymptom of a foul ſtomach, the cooling purgative may be given previous to the emetic or any antimonial medicine.

It happens not unfrequently that theſe evacuations, without carrying the fever away intirely, produce ſome abatement, and a more evident diſtinct remiſſion than was before. The more diſtinct the remiſſions are, the greater probability is there of putting an end to the fever. However violent the ſymptoms during the exacerbation may be, the chance of this is greater when the remiſſion is tolerably evident, even although the acceſſion be violent, than when the laſt is more mild and the remiſſion leſs obvious; becauſe in the former caſe the uſe of the Peruvian bark is ſafer and more certain. But if the opportunity of carrying off the fever, which ſuch remiſſions afford, is not improved, they often become leſs diſtinct,

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and the fever of courſe more dangerous. Six drachms of the powder of bark for an adult, or as near that quantity as the patient can be prevailed on to take, ſhould be given during the remiſſion; and as this is generally ſhort, the doſes muſt be large, and repeated frequently, to make ſure of giving that quantity during the interval: If this ſucceeds, the ſame medicine ſhould be continued, in ſmaller quantity, for ſeveral days.

There is no danger in making this trial by the bark when there is little or no inflammatory diatheſis, which there is great reaſon to believe is the caſe when the febrile ſymptoms abate conſiderably, and when the remiſſion becomes more diſtinct immediately after the firſt evacuations.

It was long an almoſt univerſal opinion, and is ſtill the opinion of many, that bark cannot ſafely be given in any fevers but the intermittent, and not in them till the intermiſſion

termiſſion is perfect. In unformed intermittents, therefore, and the remitting fevers now under conſideration, the practice was to give neutral ſalts and ſaline mixtures after the firſt evacuations, in the expectation that by the continuing theſe medicines the *remiſſions* would gradually become *complete intermiſſions*, and then the bark might be given with ſafety.

But this expectation was ſo often diſappointed, and the remiſſions, inſtead of becoming longer and more diſtinct during this ſuſpenſion of the bark, were ſo apt to diſappear altogether, and the fever to advance with a leſs interrupted pace and more violent ſymptoms, that ſome practitioners, on whoſe minds long-eſtabliſhed opinions had leſs influence than ordinary, ventured to give the bark without waiting for ſuch a perfect intermiſſion as the common practice preſcribed; and their boldneſs, in many inſtances, was crowned with ſucceſs.

Mr. Cleghorn, formerly ſurgeon to a regiment at Minorca, and afterwards lecturer in anatomy in the univerſity of Dublin, by his obſervations on the epidemical diſeaſes of that iſland, contributed greatly to the removal of this prejudice. That gentleman diſplays in his book * great learning, a moſt acute judgment, and much liberality of mind; he candidly acknowledges the errors of his early practice; and to prevent others from falling into the ſame, ſeems to have been his chief inducement for publiſhing; and there is good reaſon to believe that his publication has ſaved many lives. His obſervations have been confirmed by thoſe of ſeveral judicious practitioners who have appeared ſince. But he whoſe penetration firſt overcomes an hurtful prejudice is entitled to the firſt praiſe.

* Vide Obſervations on the Epidemical Diſeaſes of Minorca, by George Cleghorn, Surgeon to General Offarrel's regiment.

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The experience of candid and judicious practitioners *alone* ought to have weight in determining the propriety or impropriety of this method, which can neither be ſtrengthened nor weakened by any inquiry into the manner in which the bark acts, whether it is by a tonic power, acting on the nerves of the ſtomach, and communicated by them to the whole body, or whether it produces its effects in a ſlower manner by its operation on the fluids: Such inquiries are far more curious than uſeful; but were they more uſeful than curious, the inveſtigation would be equally fruitleſs; and thoſe who heſitate to give the bark till it is clearly made out in what manner it performs its effects, will, in all human probability, continue heſitating to the end of their lives.

It is not unuſual for thoſe who ſeem to have the higheſt opinion of the virtues of Peruvian bark to give it in conjunction with

ſnake-root, chamomile-flowers, and other bitters, with a view to render it ſtill more efficacious.

But univerſal experience has eſtabliſhed the Peruvian bark as the moſt powerful febrifuge of all the claſs of bitters, or indeed of any other claſs of medicines; yet ſometimes it fails, merely becauſe the patient's ſtomach cannot bear the due quantity for producing the deſired effect;—if we intermingle any other bitter we muſt neceſſarily withdraw a proportional quantity of bark, that is to ſay, we muſt ſubſtitute a certain quantity of a weaker remedy in the place of a ſtronger, which to a man of plain unrefined underſtanding, would not appear the moſt probable method of overcoming a diſeaſe—experience having alſo proved that the bark ſits as eaſy upon the ſtomach as any bitter, the giving any other bitter, over and above, will hardly be ſuppoſed the beſt way of enabling the ſtomach to retain a greater quantity of bark.

bark. Sydenham ſays, " Neque enim re-
" mediorum pompæ libuit indulgere; cum
" ſane, qui aliquid *cortici* adjiciunt, præter
" vehiculum, eidem in ventriculum tranſ-
" mittendo neceſſarium, aut ex ignorantia
" peccant, ut mihi videtur, aut dolo malo."

This obſervation is certainly too ſevere; yet however proper combinations may be on other occaſions, they ſeem improper on this, where the view is ſolely to give as much bark during a remiſſion of the fever, as will afford the greateſt probability of preventing its return. Indeed combinations, too often, while they render a preſcription more pompous, make it leſs efficacious.

There is no doubt that the danger of giving the bark in this fever, has been greatly magnified; the notion, in particular, that it checks the ſecretions, and ſuppreſſes beneficial diſcharges, has probably ariſen from fallacious reaſoning *à priori*, for the

experience of the moſt accurate obſervers teaches us, that although this medicine has a powerful effect in ſtopping thoſe partial colliquative ſweats, which are at once the effect and the cauſe of weakneſs, yet it often promotes warm, univerſal, and critical perſpiration. The ſame experience ſhews, that the opinion of its having a tendency to form obſtructions in the liver and other abdominal viſcera, and lay a foundation for future dropſies, is equally ill-founded; and that various other bad effects, the real offspring of diſeaſe, but which the bark, had it been given in time, would have prevented, have been unjuſtly imputed to the medicine, merely becauſe it had not the ſame effect when it was given too late.

To adminiſter the bark indeed, while there are ſtrong ſymptoms of an inflammatory diſpoſition, and little or no remiſſion, is dangerous; and to throw it into the ſtomach

ſtomach and bowels, while they are replete with bilious or acrimonious fluids would be ineffectual; it is therefore ſometimes neceſſary to abate the violence of the firſt by bleeding, and obviate the ſecond by cleanſing the alimentary canal, that this powerful medicine may not do harm, by augmenting the already too forcible action of the heart and arteries in the one caſe; and that its virtues may not be drowned by an accumulated flood of coluvies in the other*.

But if, notwithſtanding thoſe evacuations, the fever continues with augmenting force and ſhortening remiſſions, ſo that the bark cannot with propriety be given, or having been given, produces no abatement of the

* In hot climates it is not ſo requiſite, nor indeed ſo ſafe, to try the uſual means of bringing this diſeaſe to more diſtinct remiſſions, or at leaſt we dare not riſk the trial ſo long as in colder countries; becauſe in the former every hour of delay threatens that fatal debility which renders all medicine uſeleſs. And the very circumſtance which may prompt us to uſe the bark more readily, muſt make us uſe bleeding more reluctantly; for exceſſive heat augments the debilitating tendency of the fever.

diſeaſe: If, on the contrary, after its uſe the tongue becomes parched, and the ſkin drier and more hot, the bark muſt be diſcontinued; and the beſt we can do is to return to the antimonials, but in ſuch ſmall doſes, as without exciting vomiting will give a determination of fluids to the ſkin, promote perſpiration, and keep the body open.

Small doſes of James's powder I have generally found to act in this way with as much certainty and mildneſs as any form in which antimony can be exhibited, giving at the ſame time repeated doſes of Riverius's anti-emetic mixture. This medicine, *when taken in the moment of effervescence*, is peculiarly grateful and refreſhing to the parched mouth and ſqueamiſh ſtomach of the patient, and for theſe and other reaſons is probably *then* moſt beneficial. Some practitioners have occaſionally given a ſolution of the alkaline ſalt, and immediately above it the proper quantity of lemon juice, that the

the effervescence might take place entirely in the stomach; but the alkaline solution is so very nauseous that few patients can swallow it: To obviate this, others have thought of giving the salt in a bolus,—but who can say, that immediately on the alkaline salt entering the stomach, it may not meet with something there which may instantly change its nature, and prevent it from effervescing with the lemon juice?

The antimonial alteratives, the saline mixtures, in the usual way, or neutral medicines in any other form, are therefore to be preferred, and will be rendered more effectual by keeping the patient's bed-chamber moderately cool, having it always well ventilated and refreshed with vinegar; and by encouraging the patient to drink abundantly of cooling subacid drinks, as lemonade, imperial*, toast and water, acidulated

* The cooling aperient qualities and acid taste of cream of tartar, of which this liquor is composed, render it a very proper and agreeable addition to many of the patient's drinks.

with ſpirit of vitriol, or whatever other drink of the ſame nature is moſt agreeable to his taſte;——his taſte will very ſeldom direct him wrong.

In the laſt century, and that immediately preceding it, the minds of mankind ſeem to have been obſcured with ideas equally gloomy in religion and in medicine; every thing pleaſing was thought ſinful; and by many enthuſiaſts, what gives the higheſt pleaſure was conſidered as the greateſt ſin. The phyſicians ſeem to have adopted the prevailing ſentiment of the times, and to have applied it to the practice of phyſic; they condemned every thing that was agreeable to a ſick perſon's taſte or feelings, and declared it noxious to his conſtitution, and the more noxious in proportion as it was agreeable. In many inſtances they treated their patients, as if they had been perſuaded that the moſt effectual way to reſtore health, was to preſcribe what was moſt repugnant

to

to his taſte. If he complained of heat, additional bed-clothes were heaped upon him to force a ſweat; if half ſtifled, he begged for a little freſh air, the bed curtains were drawn cloſer, becauſe cold ought to be moſt guarded againſt when the body is hotteſt; and if he complained of thirſt, and entreated for a draught of cool water, he was preſented with a *draught* from the apothecary's ſhop, well impregnated with ſpiceries.

How many fevers would have terminated favourably, had the pleadings of Nature been liſtened to, and the wiſhes of the patients gratified, which, by this horrid treatment, have degenerated into petechial malignity! How many victims, ſince the period above alluded to, have been ſacrificed to the pride and obſtinacy of miſtaken ſcience, dazzled by the meteors of theory, and deſpiſing the humble path of experience pointed out by the earlieſt phyſicians.

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The prejudices in favour of ſudorifics, and the hot regimen in fevers, is now however pretty much removed; irreſiſtible experiment obliges the haughtieſt doctor to acknowledge, that the beſt way of cooling a human body heated by fever, is that which cools every other hot body, and would naturally occur to the moſt untutored mind, which *proud ſcience never taught to ſtray*, namely, the admiſſion of a cool atmoſphere*.

It ſeems equally obvious, that the moſt effectual way of allaying intenſe thirſt, is abundant drinking of quenching liquids; and that the proper aliment for a feveriſh and capricious ſtomach, is not that which it loaths, as it does every kind and every preparation of animal food, but that which it longs for, which is the caſe with almoſt all

* Although it is highly proper that the chamber ſhould be well ventilated and cool, it need hardly be added, that the patient's body muſt not be expoſed to cold too ſuddenly; nor ought he to lie or ſit in a draught of air.

ſorts

ſorts of mild, juicy, ripe fruit; theſe ſpread a refreſhing moiſture over the parched tongue and throat of the languid patient, moderate the ardour of his thirſt, dilute and cool the heat of his juices, promote urine, and tend to keep the belly open.

The laſt is a point of great importance to this fever, where we often find a tendency to new accumulations in the inteſtines, as ſoon as the old are removed, or of bilious redundancy in the gall bladder and its ducts; the firſt may be ſuſpected from the patient's becoming coſtive, and ſeeming more oppreſſed and reſtleſs; the ſecond, by a fullneſs and uneaſy ſenſation in the region of the liver. When theſe happen, therefore, and the ſubacid drinks, ripe fruits, and alterative doſes of tartar emetic, aſſiſted by emollient clyſters, are not ſufficient to prevent them, it is abſolutely neceſſary to repeat the purgatives; which may conſiſt of combinations of ſena with ſoluble tartar, cream

cream of tartar, manna, or tamarinds, of ſome of the latter without the ſena, of rhubarb with ſal polychreſt, or a ſimple ſolution of ſal Glauberi, Rupellenſis, or of the ſal catharticus amarus in water. The laſt I have always found a certain, eaſy, effectual, and expeditious purgative.

With reſpect to the particular cathartic that ſhould be uſed, this will in ſome meaſure depend on the conſtitution, taſte, or even prejudices of the patient, and other circumſtances: Wherever there is a conſiderable choice of medicines of the ſame nature, and nearly of the ſame powers, practitioners always have been, and always will be, of different opinions: Accidental events, in the courſe of his own particular experience, may lead a phyſician to prefer one medicine to all of the ſame claſs, though all perhaps are equal in virtue to his favourite; he will be ſtill more apt to conceive an affection for a combination of two

or

or three of the ſame claſs together, if he imagines that he himſelf is the original combiner, he will of courſe order and recommend this combination on every occaſion where a purgative is needed, and as he ſeldom or never orders any other, he may ſafely ſwear that he finds none of equal efficacy. One phyſician giving a great preference to a combination of his own invention, is ſeldom found to be a prevailing reaſon with his brethren for adopting it*. It is fortunate, however, that all judicious practitioners agree in recommending only ſuch mild cathartics as thoſe above mentioned, which perform their office eaſily, and without griping or otherwiſe agitating the patient.

* Thoſe, therefore, who deſire that it ſhould come into general uſe, and appear in the preſcriptions of others, had beſt not add the emphatic word *noſter* to the name of the medicine in their own, as that ſeems (though certainly the reaſon is not a good one) to incline their faſtidious brethren to reject it.

After

After a general idea of a diſeaſe is given, and the nature of the treatment it requires pointed out, particular forms of preſcription, and the proportions of the combined ingredients, muſt be left to the judgment of the attending phyſician, who alone can adapt it to the conſtitution and circumſtances of the patient.

Medical forms of preſcription are temporary and tranſient, they vary with other faſhions*: Preſcriptions complicated with a

* It may ſeem extravagant to ſay there is a faſhion even in diſeaſes; yet I am much miſtaken if the leaders of faſhion in London, as well as in Paris, do not ſometimes give a *ton* to particular complaints which ſoon renders them epidemic.—When the fair Queen of France, or the Ducheſs of ——— catch a cold, and are told by their phyſicians, that the diſtemper is bilious or nervous, or any other medical name, which makes a plain matter myſterious; they repeat the terms, are univerſally ſympathiſed with, and *bilious* and *nervous* complaints become as univerſal as *faſhes* and *feathers*.

In the reign of Lewis XIV. after the King's diſtemper was announced, fiſtulas, we are told, became much the mode among the courtiers at Verſailles.

multiplicity

multiplicity of materials were greatly the fashion formerly; a veneration for antiquity still preserves in our pharmacopœias some of a most extravagant exuberance; the vast host of whose opposing ingredients, like the earth-born soldiers of Cadmus, mutually destroy each other. In general however, complicated prescriptions are now disapproved of, and far simpler, more certain, and it is to be hoped more efficacious forms of prescription are the present mode.

A repetition of the mildest purgatives has been objected to, from an apprehension of their diminishing the patient's strength; but it must be remembered, that nothing is more exhausting than the heat and restlessness occasioned by acrimonious absorption. When an accumulation of bile and other matter in the bowels therefore is indicated, by a swelling and tension of the belly, and by other symptoms, the purgative which removes

theſe impurities from the firſt paſſages, proves in effect a ſtrengthener and not a weakener. Beſides, this accumulation of impurities is apt to burſt forth in a violent diarrhæa, which might not be eaſily checked, even when the patient's ſtrength ſeemed ſinking under it, but which may be prevented by a well-timed purgative.

The calm ſleep which the patient ſometimes enjoys immediately after the operation of a laxative, is a proof that the preceding reſtleſſneſs was owing to this accumulation.

When the tenſion is great, and the belly ſore to the touch, emollient fomentations give eaſe, and emollient clyſters are ſerviceable, both as internal fomentations, and by haſtening the operation of the laxative.

After a proper purgative has had its full effect, giving fifteen grains of the powder of Columbo root, rubbed up with double the quantity of tartarum vitriolatum, nitrum vitriolatum,

vitriolatum, tartarum ſolubile, or ſal diureticus mixed with ſome of the ſimple diſtilled waters, and given two or three times a day in the form of a draught, has often a good effect in preventing coſtiveneſs and the ſwelling of the belly, and in promoting the ſecretion of urine. The powder of Columbo is gently laxative and agreeably bitter; it has a tendency to remove nauſea, and can ſometimes be taken without reluctance when other medicines of the ſame claſs create diſguſt; and may either be given with ſome of the neutral ſalts above mentioned, or in a ſaline draught.

If the patient continue reſtleſs after the bowels have been thoroughly emptied, a gentle anodyne may be ventured upon; that combination of opium, ipecacuanha, and neutral ſalt, which is known by the name of Dover's powders* is the ſafeſt I know.

* As there are various receipts for Dover's powders, in ſome of which the proportion of opium is very different from

know. Two or three grains may be given in a ſaline draught every two hours till it has effect, which often happens after the firſt or ſecond doſe. This medicine generally produces perſpiration as well as ſleep; ſome of the bad effects of which opium is accuſed, when given alone, are prevented when it is qualified with the emetic and neutral ſalt. It ſtill retains however the quality of producing coſtiveneſs; and therefore this medicine ought not to be given where there are ſymptoms of bilious redundancy, except immediately after a purgative; and not then, unleſs the patient has been for a conſiderable time haraſſed with want of ſleep; neither muſt it be continued beyond three or four ſuch doſes. Towards the end of the fever, when the inflammatory ſymp-

from what it is in others, it may be proper to mention, that I allude to that which has been admitted into the laſt edition of the Edinburgh Diſpenſatory.

When a liquid form is preferred to the powder, liquid laudanum, tincture of ipecacuanha, and vitriolated tartar (obſerving equivalent proportions), may be added to a ſaline draught, or given in any other vehicle.

toms

toms have disappeared, and the patient is no longer disturbed with too great a flow of bile into the bowels, this opiate, in case of restlessness, may be given with more freedom.

When by the continued use of the antimonial alteratives, saline mixtures, and the most agreeable acidulated drinks, and by the exhibition of a mild purgative, as often as there is reason to suspect a constipation of impurities in the bowels, the phlogistic diathesis gives way, and the force of the fever seems to abate; if at the same time a warm diaphoresis appears on every part of the body; if the mouth moistens; if the urine is rendered in greater quantity, and lets fall a sediment; if the pulse becomes soft and slow, and the skin cool after the sweat ceases, the fever is at an end, and the bark is not necessary, unless during the state of convalescence it is thought proper to administer it as a strengthener.

But if, without theſe deciſive ſymptoms, there is only a conſiderable remiſſion, while the remaining heat of the ſkin and quickneſs of the pulſe indicate that ſome degree of the fever ſtill lurks in the conſtitution, it will be prudent to ſeize the opportunity this remiſſion preſents, to give from half an ounce to ſix drachms of the bark, the effect of which will probably be either to prevent another acceſſion of the fever, or prevent that proſtration of ſtrength, and thoſe dangerous ſymptoms which ſometimes appear in the progreſs of this diſeaſe.

It undoubtedly requires the moſt ſerious reflection and a juſt weighing of every circumſtance on the part of the phyſician, to decide in many caſes, whether it will be beſt to delay giving the bark, and to continue the other medicines, in the hope of a greater abatement of the fever; or to profit immediately by the remiſſion which preſents itſelf, leſt a ſudden and inſuperable

weakneſs

weakneſs ſhould diſable the patient from taking it afterwards in due quantity. No abſolutely certain rule can be given in this or many other ſituations which occur in medicine; but it may be received as a maxim, which in general will be found juſt, that the danger of giving the bark too late in this fever, is greater than that of giving it too ſoon; and that the danger of bleeding too much is greater than that of not bleeding at all.

It was obſerved above, that we might be determined in ſome meaſure by the nature of the reigning epidemic, with reſpect to bleeding at the beginning of this fever.—The general courſe which the diſeaſe holds at any particular ſeaſon, may alſo determine us with regard to the period at which we ſhould begin to give the bark. For if when this fever prevails, we obſerve that while the ſymptoms are no way alarming, and while we uſe the common means of

promoting more diſtinct remiſſions, the patients are apt to be ſuddenly ſeized with exceſſive weakneſs and increaſed confuſion in the head; it will then be proper in future caſes, to give the bark earlier, that we may obviate the dangerous debility we have reaſon to dread; for having obſerved this in ſeveral caſes, we have cauſe to believe that ſuch is the general bent of the fever. Indeed it commonly happens that epidemic diſeaſes are treated more ſucceſsfully after having continued for ſome time, than when they firſt appear, on this account, becauſe we become acquainted with the various changes of the diſeaſes, and by that means are ſometimes enabled to prevent the effects of the moſt troubleſome ſymptoms.

If a ſwelling and tenſion of the belly, and other ſymptoms of accumulated impurities, have taken place before the phyſician has been called; and if the pulſe is weak and ſinking, as is generally the caſe when this ſwelling

ſwelling appears, a ſingle doſe of rhubarb and ſal polychreſt, or ſome other mild purgative, given in two or three ſpoonfuls of ſimple cinnamon water, is the only preparation that can be waited for; immediately after the operation of which, the bark ſhould be given.

Indeed at any period of the fever, if the patient unexpectedly becomes giddy, feeble, and languid, the bark muſt directly be had recourſe to, as the moſt powerful means yet known to obviate the melancholy train of ſymptoms, of which a ſudden deprivation of ſtrength is often the foreboder; but when, in ſpite of all our efforts, thoſe take place, the fever is no longer of the mixed kind, but has degenerated into a true nervous, putrid, or malignant fever, the diſeaſe of which we now mean to treat.

IV.

NERVOUS FEVER.

THE fevers already deſcribed, and indeed every diſeaſe attended with any conſiderable degree of feveriſhneſs, affect, in ſome meaſure, the nervous ſyſtem; becauſe a fever occaſions a general diſturbance of the whole animal œconomy, of which the nervous ſyſtem is a part. But in this particular fever the nervous ſyſtem is more immediately and more violently affected than in others.

When a fever is once produced, from whatever cauſe it has originated, by continuing long to operate on the body, it at length occaſions all the ſymptoms which appear in the nervous or malignant fever.

A ſkilful

A ſkilful phyſician therefore, called to viſit a patient when in the laſt ſtage of a tedious common fever, could not, with certainty, know whether it had begun with the uſual ſymptoms which attend the firſt ſtage of the inflammatory or the remitting fevers, or if it had appeared to be of the nervous kind from the beginning. Indeed, ſuch knowledge would be of little importance to himſelf or the patient, becauſe his buſineſs is to treat the diſeaſe, not according to the ſymptoms that have been, but according to thoſe which actually exiſt.

This fever, like all others, has been deſcribed by different authors under various names: The nervous fever, the jail fever, the hoſpital fever, the ſhip fever, the petechial fever, the putrid fever, and the malignant fever.

The firſt appellation it receives from its attacking the ſenſorium and nerves more immediately

immediately and more violently than other fevers generally do: The ſecond, third, and fourth, from its being apt to ariſe in jails, hoſpitals, and ſhips, where numbers of men are often obliged to be crowded together, and where ſufficient care is not always taken to have them well ventilated and cleanſed; the fifth from certain ſpots which ſometimes appear on the ſkin of patients labouring under this diſeaſe; the ſixth from a putrid ſtate or tendency, ſuppoſed to take place in the blood and juices; and the laſt from the dangerous nature and malignity of the diſeaſe.

Of all thoſe epithets, that of putrid, which is by much the moſt univerſal, ſeems, in the eyes of ſome, the moſt improper, as it implies that the ſame change takes place in the blood during this fever, that happens to animal ſubſtances after death, when they are in a ſtate of putrefaction.

Some

Some phyſiologiſts have imagined that this putreſcency is the cauſe, others that it is the effect of the fever now in queſtion.

But either as the cauſe or effect, the eſtabliſhed opinion was, that the blood acquires a ſtate of putreſcency, or becomes quite putrid during this fever.

Medical opinions, which are deep-rooted by time, and ſanctified by authority, are received at laſt as unqueſtionable truths, which it would be folly to doubt, and preſumption to inveſtigate—the bulk of mankind are too timid for the one, and too lazy for the other.

But there are ſome who are ſo much ſtruck with the number of abſurdities which have been handed down to us through ages, that their minds ſeem little diſpoſed to adopt any opinion merely on account of its antiquity.

Such men endeavour to bring all opinions to the teſt of experiment and ſtrict obſervation;

vation; and if they are found not to ſtand thoſe teſts, reject them from their creed without further ceremony, although they ſhould be ſanctified by all the medical apoſtles who have written ſince the days of Hippocrates.

Theſe unbelievers aſſert that mankind are tenacious of opinions, when once adopted, in proportion as they are extraordinary, diſagreeable, and incredible; and quote the prevalency of this notion of the blood becoming putrid in certain diſeaſes, as an illuſtration of this remark.

"That our bodies," ſay they, "return to "corruption after death, is no very pleaſant "recollection; but that our blood corrupts "while it circulates in our veins, is ſtill more "mortifying; but fortunately it is as "improbable as it is unpleaſant.

"It might naturally have been imagined," continue they, "that nothing of leſs force "than the evidence of the ſenſes, the "actually ſeeing the plaineſt and moſt un-

"equivocal

" equivocal marks of putrefaction in the " blood, and ſuch appearances in the urine " and other humours as plainly indicated " their derivation from a corrupted ſource, " could have conſtrained mankind into an " opinion to which they muſt naturally " have ſuch an averſion."

To all this the ſupporters of the doctrine of putrefaction anſwer, " That *it is* to the " plaineſt and moſt unequivocal marks, and " to the evidence of their ſenſes, that they " owe their conviction: That the putrid " ſtate of the blood and juices in this diſeaſe " is evinced by

" A loathing of animal food, vomiting, " thirſt, and a deſire of acids.

" By the cadaverous ſmell of the body, " and fœtor of the urine and perſpiration.

" By the blood which is taken from the " veins not coagulating as uſual.

" By certain ſpots or marks called pete- " chiæ or vibices, owing, as they aſſert, to " effuſions of blood below the cuticle.

" And by hemorrhage from various " parts."

The ſceptics urge in reply to thoſe inſtances, " That all ſupporters of a ſyſtem, " eſpecially one long eſtabliſhed, in the be- " lief of which they have been bred from " their youth, and which ſome of them " have taught from the profeſſorial chair, " are apt to dwell with complacency on " every circumſtance which ſeems to favour " it; and ſometimes they do not ſcruple to " bend to the ſame ſide thoſe circumſtances " which have a natural bias the contrary " way.

" That to this diſpoſition alone we muſt " refer the bold aſſertions we find in medi- " cal books, that the blood, and all the ex- " cretions, diſplay evident marks of putri- " dity and corruption.

" That a loathing of animal food, vomit- " ing, thirſt, and deſire of acids, are com- " mon in other fevers, and in many diſeaſes

" which are not even ſuſpected of being of a " putrid nature. With reſpect to the cada- " verous ſmell of the body, and fetor of the " urine and perſpiration, theſe are exagge- " rated expreſſions. The natural ſmell of " diſeaſed bodies is certainly not agreeable; " but if that circumſtance is to be taken as a " proof of putrefaction, every diſeaſe almoſt " to which men are liable may be called " putrid; but in complaints which do not " labour under ſo bad a name, the ſame " ſmell is expreſſed by the gentle term of " ſickly, which in diſeaſes whoſe names " impreſs the idea of corruption, are " ſtigmatized with groſſer epithets. But " every one who has been accuſtomed to " the examination of diſeaſed and of dead " bodies, muſt be ſenſible that the term of " putrid, which belongs to the one, never " can be uſed with propriety to the " other."

They deſire us to take the trouble of conſidering what putrefaction really is.

"That all animal bodies, ſoon after "death, begin to putrefy, that is, their "conſtituent parts ſeparate, and new com- "pounds are formed; during which pro- "ceſs a peculiarly fetid vapour ariſes, and "a large quantity of fixed air is let looſe.

"That any part of the ſolid ſubſtance, "blood, or humours of an animal, cut off "or ſeparated from the body, exhibit the "ſame phenomena."

They acknowledge, "that when any part "of the body is ſo ſeverely injured, whether "by external violence or internal diſeaſe, "that there no longer is either ſenſation or "circulation in that part, it then no longer "belongs to the body, but is in the ſtate "of a part ſeparated, diſtinct, and dead, "and of courſe is ſubject to putrefaction, "like any other ſeparated part; but no "ſuch thing ever takes place in a living "part, or in the circulating fluids."

They likewiſe acknowledge, "that the "contents of the inteſtines, when long re-

"tained,

" tained, and particularly the redundancy " of bile which is ſometimes poured into " their cavity during this fever, become " uncommonly fetid and acrimonious, and " often produce ſevere gripes, ſwelling and " tenſion of the belly, and ſharp corroſive " ſtools of a blackiſh colour. But although " a complete putrefaction ſhould take place " in the inteſtinal contents, this circum- " ſtance could not affect the argument; " for they certainly muſt be conſidered as " extraneous matter, and no part of the " organized body.

" For they add, that in good health the " gaſtric juice, which is probably the moſt " powerful of antiſeptics, prevents any de- " gree of putreſcency in the aliment; but " when the powers of the animal œconomy " are greatly debilitated and otherwiſe " affected by diſeaſe, it is probable that the " gaſtric juice may either become weaker " in quality, or be ſeparated in ſuch ſmall " quantity as not to reſiſt the putreſcent

" tendency of the aliment or of the bile
" when extravaſated. We find that during
" the continuance of fever there is a total
" want of appetite; the conſtriction which
" takes place on the extreme veſſels of the
" external ſurface of the body, we cannot
" doubt, affects in the ſame manner the
" veſſels of all the internal ſurfaces, and
" among others thoſe of the ſtomach, the
" effect of which may be a diminiſhed
" ſecretion of the gaſtric juice; for it is
" agreeable to the wiſdom of Nature to
" ſuppoſe that little of this juice will be
" ſecreted at a period when there is little
" uſe for it; or perhaps in the ſame man-
" ner that the ſight or thoughts of food
" excite the ſecretion of ſaliva, ſo appe-
" tite may excite the ſecretion of the
" gaſtric juice; of courſe, when there is no
" appetite there will be leſs ſecreted."

Theſe controvertiſts farther inſiſt, " that,
" however improper the practice may be,
" blood often has been taken from patients

" during

" during the courſe of malignant fevers;
" and they aſſert that it has not been found
" in the ſtate which the ſupporters of the
" blood's putreſcency repreſent; they de-
" clare that no particular fetor is diſcover-
" able in this blood, that it coagulates ſome-
" times with a greater, ſometimes with a
" ſmaller degree of firmneſs, but always in
" ſome degree; and that its coagulating at
" all is a proof that it is not putrid.

" That the urine, ſo far from being pe-
" culiarly fetid, often ſuffers leſs change
" in this fever than in moſt other diſeaſes.

" That the cold clammy ſweats are no
" proofs of putrefaction.

" And that accidents which ſometimes
" occur towards the end of this fever, of
" particular parts of the body mortifying,
" are to be imputed to the weakneſs of the
" general circulation, and to the preſſure,
" which entirely ſtops the circulation in
" theſe parts, when the body remains long
" in the ſame ſituation; for theſe accidents

" happen in other cafes, as in dropfies,
" where the body is greatly weakened, and
" remains too long in the fame poſture, and
" in diſeaſes whoſe cauſes are not thought
" to ariſe from any putreſcency of the fluids,
" as well as in thoſe which are.

" That the petechiæ and vibices, which
" have been thought ſtrong and irreſiſtible
" demonſtrations of the diſſolved and putrid
" ſtate of the blood, are by no means to be
" conſidered as ſuch; becauſe the whole
" force of theſe demonſtrations depends
" upon an aſſumption that thoſe ſpots are
" owing to the blood's being ſo diſſolved by
" putrefaction as to paſs through the ex-
" haling arteries, which it will be difficult
" to prove, and to which opinion there are
" ſtrong objections; for if the blood were
" ſo much diſſolved as to paſs through theſe
" capillary veſſels, we might naturally ex-
" pect hemorrhages into all the cavities
" of the body as often as there are petechiæ;
" whereas thoſe ſpots often appear when

" there

"there are no hemorrhages; and when "they happen in the putrid fever, which is "very ſeldom the caſe, it is only from the "noſe and in the cavity of the inteſtines; "and beſides, if the blood was reduced to "ſuch a ſtate of tenuity as to paſs out of "the extremities of the exhaling arteries, "and diffuſe itſelf under the cuticle, one "ſhould think it would firſt fill all the "lymphatic arteries, and not appear like a "few flea-bites, but give a purple tint to "the whites of the eyes and the whole "ſurface of the body."

And they conclude their argument by obſerving, "that if the fluids were really "corrupted in the courſe of this fever, the "bodies of all who die of it would ſhew "ſtronger and more rapid ſigns of corrup- "tion than other dead bodies. They "roundly aſſert, however, that the con- "trary of this is the fact; and, for the "truth of their aſſertion, they appeal to "thoſe who have the moſt frequent oppor-

" tunities of obſerving and examining dead
" bodies.

" To the ſame umpires they appeal for
" the truth of this other aſſertion, that the
" bodies of thoſe who die of what are called
" putrid fevers are longer before they un-
" dergo real putrefaction than of thoſe who
" die of other diſeaſes, or who die in perfect
" health by violence."

Whatever change therefore the fluids undergo in the diſeaſes in queſtion, they declare it muſt be ſomething very different from putrefaction.

But, as it frequently happens in controverſy, the ſupporters of the eſtabliſhed doctrine, ſo far from being convinced by theſe arguments, ſeem to cling with warmer zeal to the ancient faith in proportion as they feel themſelves puſhed by the reaſoning of the reformers, aſſerting that the animal fluids not only are corrupted during the courſe of putrid diſeaſes, but that, inde-

pendent

pendent of any diſeaſe, in the moſt perfect health, the ſame putreſcent tendency exiſts in the blood, which has a natural and conſtant bias to run into corruption; and the evidence of the nurſe, mentioned on a former occaſion, is called in confirmation of this,

"Let her faſt," ſay they, "for fifteen or "twenty hours, and her milk, which be- "fore was white, thin, and grateful, becomes "yellow, thick, and diſagreeable; or let "any perſon in good health be deprived of "aliment, and the ſalts in his blood will "become more and more acrimonious, till "putrefaction and death enſue." And ſome eminent writers have gone the length of declaring, that a diet, conſiſting merely of fleſh, fiſh, ſpices, and water, will very ſoon bring on a putrid fever.

Here the ſceptic exclaims, "this indeed "is filling the chalice of human wretched- "neſs to the brim: At this rate the whole "life of man is a continued ſtate of corrup-

"tion,

" tion, in a corporeal as well as a ſpiritual
" ſenſe: We are not only born in ſin and
" brought forth in iniquity, but we are alſo
" born in a putrid fever and brought forth
" in an hoſpital of incurables, where the
" diſeaſes grow every day more inveterate,
" and of which all the patients die at laſt."

But whatever force there may be in the general opinion of the putreſcent tendency of the fluids, theſe illuſtrations ſeem not to have a great deal. An alteration, it is ſaid, takes place in the milk of nurſes, in conſequence of too long faſting—unqueſtionably: How can it be otherwiſe? The ſource from whence the milk is ſeparated not being refreſhed and diluted with the uſual and neceſſary nouriſhment, the milk of courſe muſt be leſs abundant and leſs agreeable.

Well, but it is added, let any perſon, although in perfect health, be deprived of aliment, and his blood will become more and more acrimonious, and *putrefaction* and death will enſue.

Let

Let the word putrefaction be omitted, and this may be granted alſo; for as the excretions and ſecretions are all going on, and no freſh ſupplies thrown in, except what is abſorbed from the atmoſphere, the blood of courſe will be greatly changed; and if the perſon continue to be deprived of food, death will undoubtedly enſue; but whether the *putrefaction* takes place before he dies, or not till afterwards, is the queſtion.

Thoſe who aſſert that a diet of fleſh, fiſh, and water, will throw animal fluids into putridity, have forgot that ſome animals live entirely upon that food.

It is not to be inferred, however, that every author who applies the epithet of putrid to a fever, actually believes that the fluids are then in a ſtate of real putreſcency —that term has been long uſed to diſtinguiſh a particular fever. There is the higheſt authority for the uſe of expreſſions adapted to the underſtandings and received opinions

of

of thoſe to whom they are addreſſed, although the idea they convey is known to be, in a literal ſenſe, erroneous. Even at preſent, when it is pretty generally believed that the ſun remains always in the ſame place, yet it is as common to talk of his riſing in the eaſt, and ſetting in the weſt, as it was in the days of Joſhua.

With thoſe who think that the blood of living animals is ſubject to putreſcency, it has been much the faſhion to make experiments on animal ſubſtances with various medicines, with a view to aſcertain their powers of preventing thoſe animal ſubſtances from corruption.

Whatever was found to have this power, though in ever ſo ſmall a degree, was adorned with the name of an antiſeptic; thoſe which prevented corruption for a longer time were conſidered as more powerful antiſeptics; and thoſe which could reſtore a piece of fleſh to freſhneſs, after it was actually

actually tainted, were thought the ſtrongeſt of all antiſeptics; and it was expected they would retain their powers in the ſame proportions in the living body, when adminiſtered in this fever or other diſeaſes called putrid.

In conſequence of thoſe experiments, the ſhops were ſoon furniſhed with ſuch a numerous liſt of antiſeptics, that many well-diſpoſed people began to conceive hopes that putrid diſeaſes of every kind, and particularly the fever ſo named, would be entirely baniſhed from the world.

But it ſoon appeared, even to thoſe who had the greateſt conviction that putreſcency exiſted in the blood of living animals, that the antiſeptic feats performed upon the dead fibres that were ſouſed into a bottle full of thoſe drugs, were not ſo apparent when the drugs were received into the body of the diſeaſed animal.

Theſe laſt experiments alſo produced a total confuſion of rank in the army of antiſeptics; many that were advanced to high power and pre-eminence, when employed upon the dead fibres, were thrown into a very ſubaltern ſituation after they had been tried on the living body.

It was unqueſtionably not an unnatural idea to imagine, that thoſe medicines which preſerved animal fibres from corruption, or recovered them when corrupted, might have an analogous effect upon the living body, if the living body could be in the ſame ſtate; and therefore to make the trial was moſt meritorious.

And it is highly to the honour of Sir John Pringle, that he did not allow his attachment to ſyſtem to blind him with reſpect to the reſult of the experiments he ſo diligently made; for although the root of wild valerian, camphor, and other drugs appeared

peared to have greater antiſeptic powers out of the body, than the Peruvian bark itſelf, yet he candidly avows, that while the latter has the moſt ſalutary efficacy in the cure of putrid diſeaſes, the former have little or none. Yet this of itſelf is ſufficient to ſhew how erroneous it is to make the operation of any medicine upon the dead fibre, a criterion by which we can judge of its effect on the living animal; it alſo goes a great way to prove, that the ſtate of the blood and juices in the diſeaſes denominated putrid, is very different from that putrefaction which takes place in the human body after death.

Dr. Millman, in his Enquiry into the Source of the Scurvy and of Putrid Fevers, has argued this point with the acuteneſs of a philoſopher, and the liberality of a gentleman. He ſeems to doubt, and he aſſigns good reaſons for doubting, whether the miaſmata ariſing from impure ſources, or whatever

ever elſe may be the cauſes of putrid fevers, are themſelves putrid; while he ſhews that the affirmative of this propoſition has been taken for granted without proof, he fairly acknowledges that he is unable to prove the negative: But he clearly proves, that of whatever nature theſe miaſmata may be, the medicines called antiſeptics are no antidotes againſt their noxious effects; and brings ſtrong arguments in ſupport of his own opinion, that a putrid ſtate of the blood is at no time and in no diſeaſe one of their effects; which ſtate of the blood, he thinks, is quite incompatible with life. He next proceeds to eſtabliſh a new explanation of the matter; and although much preciſion and ingenuity appear throughout this performance, yet here the reaſoning ſeems not ſo convincing as elſewhere.

In the opinion of this learned and ingenious gentleman, the ſeat of all putrid diſeaſes is the muſcular fibres, and the immediate ſource from which all their ſymptoms

toms ſpring, is a diminution of the vital power by which they contract; and which he alſo thinks they poſſeſs independent of the nervous ſyſtem. And to elude the objection that might be made to the ſuppoſition, that the ſame cauſe which diminiſhes the force of the voluntary muſcles increaſes that of the heart, he admits that the force of the heart is alſo impaired; but he imagines that although it is thus rendered leſs *irritable*, yet it is more *irritated* by an unuſual quantity of blood being repelled to the heart by the ſpaſm on the ſurface.

But even if this were conſidered as ſufficient to remove the objection to the frequent contractions of the heart, the ſpaſm itſelf remains unaccounted for; and it ſeems extraordinary, that in a diſeaſe depending, as Dr. Millman ſuppoſes, on a diminution of the power of the muſcular fibres, there ſhould exiſt an obſtinate *contraction* of the veſſels on the ſurface of the body; for there

is no increaſed irritation of theſe veſſels, as he imagines there is in the heart.

Upon the whole, therefore, the exceſſive debility obſervable in the nervous fever, ſeems to be as naturally accounted for by ſuppoſing that the human effluvia, or whatever is its cauſe, acts upon the brain, by impairing its energy and that of the nerves, and ſo diminiſhing the contractile force of the muſcular fibres, as by ſuppoſing that it acts directly upon the fibres themſelves, diminiſhing their vital power.

As fevers of every kind begin by occaſioning a ſenſe of cold or a ſhivering, and have ſome other ſymptoms in common; and as all fevers, when continued a certain time without any favourable change, aſſume nearly the ſame appearance, ſome people have been tempted to think that they all proceed from the ſame cauſe; and that the only difference among them depends upon the ſmaller

ſmaller or greater degree of force in that cauſe, and upon the difference of conſtitution of the perſons ſeized.

But their diſplaying different ſymptoms at the beginning, and requiring a very different treatment in their progreſs, ſeems to announce that their cauſes muſt be different: And he who believes it to be the ſame, becauſe when the perſeverance of the diſtemper has conſumed every ſource of diſtinction in the nerves, in the fibres, and in the veſſels, all fevers terminate in the ſame deplorable ſtate of comatoſe inſenſibility, may with equal reaſon believe that all the vaſt variety of plants, however different in appearance and virtue, ſpring from the ſame ſeed; and that their only difference depends on the quality of the ſeed and ſoil, becauſe by calcination they may all be reduced to a fixed ſalt of the ſame nature.

But here is another fever, different in its ſymptoms from the inflammatory or even

the mixed, and in which we evidently and ſpeedily do harm, if we obſerve the ſame practice which does good in the former; we therefore cannot help thinking it proceeds from a different cauſe. Cold, marſh miaſmata, and the other cauſes aſſigned as the ſources of the other fevers, do not account to us for the greater malignity of this.

In endeavouring to trace this new diſeaſe to its ſource, we conſider attentively what particular ſituations people generally are in, or what peculiar circumſtances uſually attend them when they are ſeized with this fever; and, as in other diſeaſes, we call theſe its cauſes, although we can perceive no other relation between them and it.

We find that thoſe who have been long ſubjected to ſcanty diet, thoſe who are naturally of a weakly conſtitution, or who, having been originally of a vigorous habit, are

are weakened by exceſſes, by diſeaſe, by long courſes of medicine, particularly of mercury, by profuſe hemorrhages, are then moſt liable to this fever; we find this is alſo the caſe with thoſe who are under the impreſſions of fear, ſorrow, and remorſe; of courſe we conſider fear, ſorrow, and remorſe, and all the ſources of weakneſs above enumerated, with whatever elſe impairs the appetite and perverts digeſtion, or in any way debilitates and exhauſts the conſtitution, as prediſpoſing cauſes of this diſeaſe.

And as the depreſſing paſſions are found liable to promote this diſeaſe, ſo whatever rouſes and exhilarates the mind, has a tendency to render the conſtitution leſs ſuſceptible of this damping contagion, and aſſiſts the recovery of convaleſcents.

The ſalutary effects of victory on the conſtitutions of Britiſh ſeamen, are well deſcribed by Dr. Blane, late phyſician to the

fleet under the command of Lord Rodney, who furniſhed that gentleman with more frequent opportunities of making ſuch comfortable obſervations, than the medical practitioners in any other fleet enjoyed during the laſt war*.

One of the moſt diſtinguiſhing ſymptoms of this fever being great debility, a natural connection is obſervable between theſe cauſes and the fever; it may therefore be thought, that even *à priori* we could have predicted the effect from conſidering the cauſes.

But when we attempt this, for one inſtance in which we predict right, in ninety-nine we ſhall prophecy wrong; and even

* It is hoped that none of the ſurgeons of the navy will imagine, that any reflection is here intended againſt them; there can be no doubt that they would have been equally ready to have made ſimilar obſervations had ſimilar occaſions occurred: It is only meant here to do juſtice to Dr. Blane, who having had the good fortune to meet with ſuch opportunities, did not allow them to paſs unimproved.

here

here the ſole connection that we can perceive, lies in the debility;—thoſe imputed cauſes ſeem to have no relation to the other ſymptoms of the diſeaſe.

But obſervation has acquainted us with a different ſource of this fever, which acts with more force and more certainty than all the others, and is produced by the crowding and confining too great a number of people within any place where there is not a free ventilation, and which we therefore conclude to be the effluvia flowing from the human body*.

Here

* Dr. John Hunter, in a very ſenſible paper in the Medical Tranſactions, has proved, contrary to the common opinion, that this ſource of the diſeaſe is more apt to be generated in cold weather than hot. This gentleman having obſerved, in various inſtances, the diſeaſe with all its diſtinguiſhing ſymptoms in the coldeſt weather of winter, and always in poor families, where a number being confined to one ſmall chamber, and unable to purchaſe fuel, aſſiduouſly ſhut out the external air to keep themſelves warm; by which means the effluvia of the wretched inmates

Here our reaſoning *à priori* would probably have been at fault, for it would not naturally occur to the imagination of any man, that the effluvia of his own body is more noxious to his health than cold, than the effluvia of putrefying vegetables, inſects, corrupted water, and all the other cauſes of fevers.

Experience alone could have inſtructed us in this; and the ſame experience has taught us, that when the fever is once generated by people in health being thus crowded, it is rendered ſtill more malignant, by the contagion of thoſe who are ſeized with the diſeaſe, and even by the effluvia flowing from thoſe who are ill of any other diſeaſe,

inmates was gradually collected, and the ſtagnating atmoſphere of the apartment vitiated, ſo as to involve, one after another, the whole of them in the ſame calamity.

In this manner Dr. Hunter obſerves, cold, inſtead of preventing this fever, becomes indirectly a means of producing it; as heat in the warm countries, by inducing the inhabitants to uſe every means of procuring a free ventilation, tends to prevent it.

particularly

particularly the ſmall-pox; and alſo by the effluvia of wounds or ulcers, when people ſo affected are, unfortunately for themſelves and for their neighbours, crowded into the ſame place.

We are therefore not ſurpriſed to find it often in barracks, tranſport-ſhips, and hoſpitals, where there is a neceſſity of crowding too great numbers together, and where it is not always poſſible to have a ſufficient ventilation.

Still leſs need we be ſurpriſed to find it ariſe in priſons, where naſtineſs, fear, and remorſe may be ſuppoſed to concur with the other cauſes in giving a peculiar degree of malignity to the diſeaſe.

In ſome caſes of great malignity, as has been mentioned, this fever becomes ſo highly contagious, that every thing which comes in contact with the patient's body becomes a ſource of the fever.

There

There are ſome conſtitutions ſo very ſuſceptible of this kind of infection, that they cannot remain an hour within the walls of an hoſpital, even when there is no malignant fever, without perceiving ſome degree of headach and debility for ſeveral hours after.

It has not only been obſerved that people of a weakly conſtitution are moſt liable to this diſeaſe, but alſo that people of every conſtitution are moſt liable when in a relaxed ſtate; thus a perſon will be more apt to catch this diſeaſe by *ſleeping* a few hours in a place where it prevails, than by remaining the ſame time in the ſame place *awake*; and thoſe who are apt to have headachs, and feel debility after viſiting hoſpitals, are more apt, when they pay thoſe viſits faſting, than if they take a glaſs of wine, and eat a piece of bread previous to their entering them.

For

For as people of a vigorous conſtitution are leſs prediſpoſed to this contagion than the weakly, ſo whatever rouſes the powers of the conſtitution, and creates a temporary vigour, ſeems to enable it, for the time at leaſt, to reſiſt a certain degree of contagion.

The human conſtitution however, as in many other inſtances, by degrees habituates itſelf to this kind of atmoſphere, ſo as at length to become little ſuſceptible of infection, even where very infectious diſeaſes prevail. Phyſicians and ſurgeons who are much accuſtomed to attend the ſick, and nurſes who live almoſt conſtantly in hoſpitals, are not near ſo apt to be affected by impure air, or by contagion, as others*.—Nothing is a ſtronger indication of the

* Experiments have been made of gradually accuſtoming mice and other animals to foul air, from which it appears that they come at length to live without inconveniency in air which proves almoſt immediately fatal to animals of the ſame ſpecies, taken directly from the common atmoſphere, and who have never been ſo habituated.

violent

violent nature of the fever, which at any time prevails in an hoſpital, than the nurſes, and thoſe accuſtomed to live there, being infected; becauſe it proves that the virulence of the contagion is ſtronger than common.

That confined human effluvia is infinitely the ſtrongeſt and moſt active ſource of this fever, appears from innumerable obſervations, and is confirmed by this, that it is one of the few diſeaſes to which the rich, and thoſe who live in affluence and luxury, are leſs liable than the poor, who, although ſkreened from the enervating effects of luxury and other of the prediſpoſing cauſes, are much more expoſed to the contagion generated in crowded, confined, and ill-ventilated chambers. The middle ranks of mankind, who are accuſtomed to active exertions of the mind and body, and ſuch of the inferior claſs as can by moderate labour procure all the neceſſaries, and ſome of the conveniencies

conveniencies of life, and who are naturally cleanly, would be ſtill leſs liable to this fever than the luxurious, were it not for the ſingle circumſtance of their having more frequent and immediate communication with the indigent, who are ſo much expoſed to its moſt powerful ſource.

Upon the whole, we know that people of delicate, exhauſted, and ſickly conſtitutions, and thoſe whoſe minds are ſaddened by depreſſing paſſions, are greatly prediſpoſed to this diſeaſe, the immediate ſeeds of which, we alſo know, may be generated in places where the human effluvia is collected and confined. And this is the moſt eſſential part of our knowledge reſpecting the cauſe of this diſeaſe; and even this little is diſturbed with uncertainty, for we ſometimes meet with inſtances of people of *robuſt conſtitutions*, who are ſeized with the diſeaſe in all its malignity, when they are under *no depreſſing paſſion*, when the diſeaſe is *not*

epidemic, to whom we cannot trace it from any place where the human effluvia could be ſuppoſed to be confined in an uncommon degree, or from any perſon in the diſeaſe, of which perhaps there is no other perſon ill in the neighbourhood for ſeveral miles around; and in ſhort, when we cannot connect it with any of the cauſes ſuppoſed to be the ſources of the diſtemper.

On extraordinary occaſions of this kind, we have nothing for it but to ſuppoſe, that notwithſtanding the apparent vigour of the patient, his body has been peculiarly prediſpoſed to catch the infection, and that ſome contagion, not forcible enough to infect any other perſon, has by ſome unobſerved means been conveyed to him; or if ſo many ſuppoſitions diſpleaſe, we may ſuppoſe at once that there is in ſome caſes a ſource of this fever which has not yet been ſuſpected. For although the numerous obſervations that have been made, give us the

ſtrongeſt reaſon to think, that human efflu-via produces this diſeaſe, we have no right to infer that it cannot ariſe alſo from ſome other ſource*.

* The difficulty of diſcovering the real ſources of diſeaſes, and *all* their ſources, appears greater in proportion to the pains which have been beſtowed in inveſtigating the ſubject: If there is a diſeaſe in the world, a certain knowledge of the origin of which is intereſting to one part of mankind more than all the reſt, it is the plague in thoſe countries where it is ſo extremely apt to break out; yet it appears from the following extract, that the moſt enlightened even there are ſtill in doubt on that ſubject.

" M. Michel, medecin de l'hopital de Smyrne, paroit, d'après un mémoire dont il eſt auteur, remis par M. le Baron de Tott, à la ſociété de médicine, croire à la ſponta-néïté de la peſte; il en cite comme preuve le fait ſuivant: Un pâtre iſolé, ne communiquant avec perſonne, tomba malade en gardant ſes troupeaux; il ſe rendit dans un lieu habité où il communiqua la peſte, dont il ſe trouva lui-même attaqué. Ce fait prouveroit beaucoup, ſi l'on pouvoit être aſſez certain que ce pâtre n'a eu de communication avec perſonne, ſi l'on ſavoit depuis combien de temps, et avec quelle precaution il étoit iſolé; mais les preuves ſont trop difficiles à établir ſur ces objets, pour qu'on puiſſe rien conclure d'après ce fait. On eſt donc contraint de reconnoître qu'on ignore également s'il eſt en effet un pays qui ſoit le berceau de la peſte, quel eſt ce pays, ſuppoſé qu'il y en ait un; enfin, ſi elle ſe declare quelquefois ſpontanément; et ſi le premier qui en eſt attaqué devient le foyer d'où elle émane."

Vide Hiſtoire de la Societé Royale de Medecine, Années 1777 & 1778, p. 305.

There

There is good reaſon to believe, from hiſtory and authentic records, that malignant fevers were formerly more frequent, more univerſal, and raged with greater violence in Europe in general, and in this iſland particularly, than they have done of late.

This is generally imputed to the ſtreets and houſes of moſt of the cities, and of London in particular, being more ſpacious, dry, and airy.

From their being infinitely more cleanly, in conſequence of the new method of paving.

From the inhabitants not being ſo much crowded together.

From their being more cleanly in their houſes and perſons.

From the poor in particular being more commodiouſly lodged, more ſalubriouſly nouriſhed, and better taken care of in all reſpects.

From

From the diſeaſe being more judiciouſly treated by medical practitioners in general. And, above all,

From our knowledge of the virtues of the Peruvian bark.

During the civil wars in Charles the Firſt's time, this fever raged with deſtructive violence in the camps, and degenerated into an abſolute plague in the capital, and in other parts of England.

Some of the circumſtances which have a tendency to ſpread this diſeaſe, and render it more malignant and peſtilential, prevail, it will be ſaid, in a greater degree in Scotland than in England; yet the latter has been more frequently ſubject to peſtilential and malignant fevers than the former; and when this calamity laſt raged with ſo much violence in the ſouthern parts of the iſland, it was little felt in the northern, which naturally may be imputed to the

mountainous nature and northerly ſituation of Scotland; the one expoſing the atmoſphere to a briſker ventilation, and the other bracing the fibres of the inhabitants by froſts of longer duration *.

This fever ſometimes creeps on in ſuch a ſlow and inſidious manner as ſcarcely to be obſerved, or wearing ſuch a mild and innocent aſpect as to give no alarm for perhaps two or three days.

The patient perceives, indeed, alternate ſenſations of heat and cold, but ſo gentle, that he thinks them of little importance.

They are followed by ſome degree of uneaſineſs in his head, by want of appetite,

* To prevent the Scots from being too much elated with this or any other advantage, they have never wanted good-natured friends, who without grudging them either their ſtorms or their froſts, are fond of reminding them of every circumſtance that may tend to moderate their pride, and who fail not to remark, that if their country is leſs ſubject to peſtilence, it is more expoſed to famine than England. This circumſtance affords thoſe of their neighbours, who are not leſs fond of a joke upon account of its age, a great advantage over the Scots in repartée.

liſtleſſneſs,

liſtleſſneſs, and dejection of ſpirits, to remove which his friends endeavour to drag him into company, or adviſe him to try to ſhake off this liſtleſſneſs by exerciſe, to which he generally is extremely averſe. In this condition his pulſe is ſometimes a little quicker, at other times about the natural ſtandard; and he himſelf, never quite well, nor apparently very ill, remains ſeveral days brooding over uncomfortable ideas, and either does not ſleep, or feels little or no refreſhment from his ſhort and diſturbed ſlumbers, ſtarting at the ſmalleſt noiſe, and ſometimes when there is none, gradually loſing ſtrength, the uneaſineſs in his head augmenting to a kind of giddineſs, his limbs and joints, particularly his knees, feeling weak, and yielding to the weight of his body; but a kind of tremor of his hands beginning to be perceived, and alſo in his tongue, when he is deſired to put it out, it is at laſt diſcovered that the patient, inſtead

of being diſturbed with vapours, is under the influence of a dangerous fever.

This fever on other occaſions attacks in a more open and avowed manner. The rigor at the beginning being ſtronger, the ſucceeding heat greater, and the pulſe quicker, but varying in this circumſtance every two or three hours, the uneaſineſs or confuſion of the head being ſtrongly marked from the firſt, and is ſometimes accompanied with a pain at the bottom of the orbit of one eye, ſometimes with a teaſing and conſtant ſenſe of throbbing in the head, which prevents ſleep and haſtens delirium.

Without either the pain at the bottom of the orbit, or this throbbing in the arteries, many have from the beginning an increaſing confuſion in the head, which with a ſlower pace conducts to ſtupor and inſenſibility, very few retaining their ſenſes till death.

Exacerbations

Exacerbations are obſervable towards night, during which the delirium ſeems a little higher, and the patient more reſtleſs. His eyes, which generally are from the beginning heavy, and a little inflamed, become now more lively, he is apt then to ſpeak quicker than uſual, and ſhews an uncommon rapidity in all his motions; a fierce anſwer from a patient of a mild character is a bad ſymptom.

Some nice obſervers think they can, in particular ſituations of this fever, diſcover the ſtate of the brain from the eyes alone.

When theſe appear unuſually quick and piercing, they imagine delirium is threatened.

When fixed and fierce, they indicate ſtartings, ſubſultus, and great ſtruggling.

When half ſhut, heavy, and bleared with tears, they import the greateſt degree of ſtupor.

When blood ſeems extravaſated in the eyes, the caſe is almoſt hopeleſs.

But in general when the patient does get any ſleep at the beginning of this fever, his eyes are only half ſhut; and when he awakes, he feels not refreſhed, and often denies that he has been aſleep at all.

Sickneſs, and even vomiting at the beginning, are not unfrequent ſymptoms, though not eſſential to this fever.

Alſo pains in the loins, and that ſenſe of wearineſs in the limbs, uſual in all fevers.

The tongue is at firſt whitiſh, and generally moiſt, as if covered with a thin moiſt white fur, and ſometimes it is of a dry, ſmooth, gloſſy, red, or crimſon appearance, which at laſt attains a dark-brown colour and horny conſiſtence.

A ſudden proſtration of ſtrength ſometimes happens, ſo that the patient is in danger

ger of fainting when he is raiſed from an horizontal poſture. When this proſtration happens early, it may be reckoned the moſt diſtinguiſhing or the pathognomonic ſign of this fever.

There is ſometimes very little thirſt through the whole courſe of this diſeaſe, at other times the thirſt is inceſſant; from about the third day there is a deficiency of the ſecretion of ſaliva, with a dryneſs and bitter taſte in the mouth.

The ſymptoms are commonly more various in this than in any other fever; the urine, though in general varying leſs than in other fevers, yet ſometimes is remarkably pale, and ſometimes of a dark-red colour. When the urine, from being thick and high-coloured, becomes thinner and paler, without any great quantity of liquor having been drank to occaſion ſuch an alteration, it is an indication of impending or increaſing delirium.

A particular eruption of little ſpots, like flea-bites, is the frequent, but not the conſtant attendant of this diſeaſe. Theſe ſpots appear generally on the neck, breaſt, and back, ſeldom on the face and limbs; they are to be ſeen, but not felt, having no elevation above the ſurface of the ſkin; they are ſeen ſometimes as early as the fifth or ſixth day, at other times not till the end of the ſecond week; they ſeldom appear after that period, and are never critical; they are rather a bad ſymptom, though many recover upon whom they appear: The ſpots are generally of a crimſon complexion, and the darker the more dangerous. When theſe petechiæ are quite black, or when purple vibices, like the weals of a ſtripe, appear at the ſame time, the danger is very great.

Bleedings at the noſe ſometimes occur at the ſame time, which are very ſeldom uſeful, but rather prognoſticate ill.

It ſometimes happens that in the firſt two days the patient loſes ſtrength to a degree that does not uſually occur till the eighth or ninth day; in ſuch caſes the patient is in the utmoſt danger, in far more than if the ſame degree of weakneſs had come on gradually. Sometimes, though rarely, the delirium is of the high kind, with a wild frantic look, with unuſual quickneſs in the voice and motions, although all the while the pulſe is low; and inſtead of a tremor of the hands, there is a ſtrong ſubſultus tendinum. Such caſes are generally accompanied with wakefulneſs, and often terminate fatally on or before the ſeventh day.

But the delirium of this fever much oftener conſiſts of a low ſtate of ſtupidity, attended with frequent muttering; in which the patient, from having been too acute of hearing, becomes almoſt perfectly deaf.—This is generally accounted a favourable ſymptom,

ſymptom, and certainly has a good effect, hindering the patient from being diſturbed by any accidental noiſe, or by the whiſpers which are apt to go on too conſtantly in his bed-chamber.

When this diſeaſe lingers, that is, when it paſſes the ſecond week, the patient is apt to continue for ſeveral days, with little alteration, in a ſtate where the inſenſibility is greater in appearance than in reality, and ſeems in a conſiderable meaſure to be owing to deafneſs; for although he is not able to combine a number of ideas, yet when a ſimple propoſition is hollowed into his ear, deſiring him to put out his tongue, or aſking if he chooſes to drink, he directly ſhews that he underſtands what is deſired. And he ſhews the ſame degree of intelligence when certain ſigns are made to him, by accommodating himſelf as much as is in his power to what is propoſed. When a veſſel containing a liquor he reliſhes is preſented

preſented to his ſight, he immediately prepares his lips for ſucking it in. When he knows that the veſſel contains a liquor he diſlikes, he ſhakes his head or ſhuts his mouth and eyes as often as it is offered.—From this ſtate, after lingering for many days with little variation, the patient not unfrequently recovers.

But there is a greater and more dangerous degree of inſenſibility, which occurs when the patient lies in this dozing ſtate, where he ſhews that kind of confuſion and want of accuracy of idea, which people have in ſome oppreſſive dreams. In this ſtate the patient evinces a ſenſe of bodily uneaſineſs, without being ſufficiently diſtinct to refer to the part of his body where the impreſſion is made.

Thus patients who are not very attentively looked after, are apt to have painful excoriations, or particular parts greatly inflamed, and even threatening mortification, from

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the mere preſſure of their bodies, by being allowed to lie too conſtantly on the ſame parts. They diſplay a general ſenſe of pain, by a frequent moaning, but have not ſufficient accuracy to point to the part affected.

The irritation of fæces in the rectum, or of urine in the bladder, ſometimes occaſions much diſtreſs to the wretched patient, whoſe oppreſſed and bewildered ſenſes cannot diſtinguiſh the cauſe of his ſufferings, and which Nature in particular caſes is tedious in relieving. But that this retention is the cauſe of his diſtreſs, is ſufficiently evident from his giving over moaning, and acquiring a ſtate of comparative eaſe and calmneſs immediately after evacuation.

This circumſtance ſhould prompt thoſe whoſe duty it is to watch over the patient, to redouble their attention, in endeavouring to diſcover the ſource of his ſufferings when he

he ſhews ſymptoms of uneaſineſs, and to make up for the confuſion of his ſenſes by the diſtinctneſs of theirs. The acuteneſs even of a nurſe on ſuch occaſions may ſave a patient whole hours of diſtreſs, and poſſibly may ſave his life.

There is a particular ſymptom, which, if I am to judge from the caſes that have come under my own obſervation, I ſhould think fully as dangerous, if not more ſo, than the laſt mentioned. When the patient lying on his back (for that is his conſtant poſture when this ſymptom occurs), with his eyes open, receives with marks of eagerneſs the drink that is preſented to him, and having taken a mouthful, keeps it in his mouth without attempting to ſwallow it; not becauſe he cannot ſwallow it, for after he has kept it in his mouth a conſiderable time, if the cup is preſented to his lips again with more drink, he immediately ſwallows the firſt mouthful, and takes a ſecond, which he

he retains in his mouth in the ſame manner as he did the firſt.

It ſeems as if the patient, upon ſeeing the liquor, has the idea of taking it into his mouth, and immediately forgets that he is to ſwallow it, which marks a very great degree of abſence or confuſion of mind; he will on theſe occaſions retain it a very long time in his mouth, and perhaps ſpit it out at laſt, or allow it to glide out imperceptibly, if no means are uſed to make him ſwallow it.——The means are, ſimply to ſhew him the liquor, and preſent the cup or ſpoon to his lips again while he has the former ſpoonful in his mouth; at ſight of a ſecond ſpoonful he ſwallows the firſt; on ſeeing a third approach he ſwallows the ſecond; and ſo on, till he has taken the full quantity intended, or till he ſhews averſion to the taking any more. The only precaution neceſſary is, to give the different ſpoonfuls at ſhort intervals, and not too rapidly,

rapidly, left a fit of coughing be raised, and the liquor rejected.

It may seem strange that the same degree of recollection that prompts the patient to suck in the liquor, does not also prompt him to swallow it. Whoever thinks so may account for it in any other manner he thinks more satisfactory; but those who will attentively observe all the various symptoms of this fever, will find, that in certain cases this happens exactly as above represented.

I myself have been assured, on entering the patient's bed-chamber, "that he could "no longer swallow; that he could take "indeed a little into his mouth; but there "he would keep it for a quarter of an "hour perhaps, and then would allow it "to escape out of his mouth again, without "swallowing a drop." On which I have called for some wine, the same liquor which I had been told the patient could not swallow, and have given him one spoonful after

another, in the manner above mentioned, till he had taken the quantity I judged proper.

A difficulty of ſwallowing, however, is alſo a ſymptom of the diſeaſe, which ſometimes proceeds from the dryneſs of the throat, and ſometimes from aphthæ on the tongue and throat; but the caſe above mentioned is an eſſentially different ſymptom.

It is alſo a very bad ſymptom, and proceeds from the ſame cauſe, when the patient, after putting out his tongue, forgets for a conſiderable time to draw it in again, or ſhews a continual uneaſineſs, by frequently throwing the bed-clothes from his body and endeavouring to get out of bed, without giving any reaſon, when aſked, for ſo doing.

The patient is frequently obſerved to draw his breath in a laborious or convulſive manner, fetching deep ſighs or rather ſobs, as if he were under ſevere affliction or felt much

much oppreſſion about the præcordia *. The breath and perſpiration alſo, in particular caſes, have been found ſtronger and more offenſive; and, upon preſſing the ſkin of the patient, a ſenſation of a peculiar penetrating heat remains on the hand for ſome minutes after; whereas the heat communicated by the ſkin of a patient in the inflammatory fever is more tranſient.

The heat of the ſkin is more moderate at the beginning, in this than in other fevers; and unfortunately, this peculiar and permanent heat is not perceptible till the diſeaſe is far advanced.

The languor and deſpondency of the patient's mind is ſtrongly marked from the beginning in the dulneſs and heavineſs of his eyes; but it is a fatal ſymptom when the eyes become blood-ſhot and glaſſy, which often happens before the termination of this fever.

* The region of the heart.

Towards the close, when Nature and the efforts of the physician prove unable to resist the malignity of the disease, all the distinguishing marks of fevers are obliterated; and the concluding scene is common to all.

The strength being almost entirely exhausted, the patient lies constantly on his back, with a perpetual propensity to slide to the bottom of the bed; the hands shake when they attempt to lay hold of any thing, and a continual twitching is observed in the tendons of his wrist; the tongue trembles when it is pushed forth for the inspection of the physician, or all attempts to push it forth are unsuccessful; a black and glutinous crust gathers on the lips and teeth, to the increase and inconveniency of which the patient seems now insensible. He seems equally insensible to the ardour of thirst; he mutters to himself; he dozes with his mouth half open, the lower jaw falling down as if the muscles were too much relaxed to resist its own gravity; he sees

objects indistinctly, as if a dark cloud hung before his eyes; small black particles, called by physicians muscheæ volitantes, play, as is believed, before his eyes; for he often catches with his hands at those or some such objects of his disordered brain; he frequently extends his arms before and above his face, seeming to contemplate his nails and fingers; at other times he fumbles with his fingers, and picks the wool from off the bed-clothes; he loses the power of retention; the evacuations pass involuntarily; and, as if lamenting his own deplorable condition, tears flow down his ghastly countenance; the pulse flutters small as a thread, and on a pressure very little stronger than common, is not felt at all; his legs and arms become cold; his nails and fingers blackish; his respiration is interrupted by hiccup, and finally by death.

It may seem superfluous to add, that a general description is different from a particular

ticular caſe; in the one all the ſymptoms are enumerated, though they cannot be ſuppoſed to be united in every individual.

In this fever it frequently happens that many of the ſymptoms now mentioned are prevented, and the duration of the diſeaſe ſhortened, by a fatal diarrhœa or dyſentery.

Some phyſicians have, by ſplitting this diſeaſe, made two diſtinct fevers, deſcribing the one under the name of the ſlow nervous, and the other under that of the putrid malignant fever.

On comparing the deſcriptions, however, or, what is of more importance, on ſtudying the ſymptoms from Nature, it will appear, at leaſt ſo it ſeems to me, that the two are eſſentially the ſame, and that the apparent difference depends upon the degree or upon the different conſtitutions of the patients.

We are told, "that the nervous fever "attacks perſons of weak nerves, thin poor "blood, dejected ſpirits, and exhauſted "habits;

" habits; whereas the putrid fever is more " likely to appear among thoſe of a fuller " habit of body, ſtronger conſtitution, and " who are accuſtomed to richer and hotter " diet."

The diſeaſe, I imagine, attacks perſons of all conſtitutions; but thoſe of the firſt deſcription are moſt ſuſceptible of it, and the ſymptoms are in ſome particulars different when it is ingrafted on the one, from what they are on the other. The eſſential ſymptom of great debility and nervous affection are common to both.

With regard to the opinion that one has its ſeat in the lymphatic and nervous juice, and the other in the blood itſelf, I have nothing to ſay farther, than that before a great deal of trouble is taken to find out what is ſeated in the nervous *juice*, it will not be amiſs to aſcertain that there is ſuch a juice; and even then the reſt of the opinion is hypothetical, will be difficult to prove,

and when proved, will leave the method of cure where it is at preſent.

Many of the ſymptoms of this nervous fever are unqueſtionably common to all fevers, and ſome of the moſt diſtinguiſhing marks of this do not appear at the beginning, or, perhaps, in many inſtances, not till a method of cure has been adopted that would not have been uſed if the nature of the diſeaſe had been known. It is of great importance therefore to detect this as ſoon as poſſible; which conſideration may form an apology for recapitulating ſuch circumſtances and ſymptoms as peculiarly diſtinguiſh this fever; and although none of them, taken ſingly, can mark with certainty its exiſtence, yet the combination of a few will form that degree of probability which juſtifies a deciſive practice.

1. Inſtead of the ſtrong hard pulſe which attends the outſet of other fevers, in this it is ſometimes ſo little altered, that we

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are apt to ſuſpect the patient exaggerates in the account of his complaints; it varies more than other fevers both in quickneſs and ſlowneſs, and alſo in ſtrength and weakneſs; and ſometimes there are conſiderable variations even in the courſe of one day.

2. The heat of the ſkin is more moderate at the beginning of this than of other fevers; for that penetrating heat of the ſkin, which is peculiar to this fever, is not perceptible at the beginning.

3. The ſkin, inſtead of appearing reddiſh, is generally pale.

4. The pain, or rather heavineſs of the head, is not ſo acute as in other fevers, but is attended with more dejection of ſpirits, and augments with a ſlow but ſteady pace, ſeldom remitting after it commences, unleſs it is checked by the bark.

5. When this heavineſs in the head is attended with tremor in the hands, there

is little doubt of the fever being of the malignant kind.

6. There is a greater degree of languor and deſpondency in this than in other fevers.

7. Greater muſcular debility.

If a ſudden and unexpected debility take place, there can be no doubt with regard to the nature of the diſeaſe *.

The malignity of this fever is generally in proportion to the debility at the beginning.

To inveſtigate the nature of the fever from the appearance of the blood, is equally uncertain and inexpedient, both becauſe at the beginning even of this fever it ſhews ſome ſhare of inflammatory buff, and be-

* Monſ. Tiſſot, when treating of malignant fevers, obſerves, that they are more dangerous than they ſeem, like a dog who bites without barking; and then proceeds to inform us, that "Le caractère diſtinctif des fièvres malignes, c'eſt la perte totale des forces dès le commencement."

This however I ſhould conſider as barking very loud; but this deciſive ſymptom does not always appear till the fever has exiſted ſome days.

cauſe

cauſe to determine whether we ought to bleed or no, is one chief reaſon of our wiſhing in the firſt place to be certain of the nature of the fever.

The weakneſs that immediately follows bleeding ſhews at once the nature of the fever and the impropriety of the evacuation.

When the ſymptoms are ſo obſcure or ambiguous that we cannot form a decided opinion reſpecting the nature of the fever, the obſcurity may be diſpelled, or at leaſt ſome light may be derived from the following circumſtances:

Whether putrid fevers prevail.

Athough no ſuch epidemic does prevail, whether any connection or communication can be traced between a ſingle perſon in this kind of fever and the patient.

Whether the patient has lately been weakened by exceſſes, by diſeaſe, by hemorrhage from wounds or otherwiſe.

Whether

Whether he has been long under the influence of the depreſſing paſſions, or of dejection of ſpirit, independent of a known cauſe.

Having paid due attention to every ſource of information, and after weighing every circumſtance, being at length ſatisfied that the fever is of the malignant kind, we proceed to the cure.

As confined air, particularly that which is loaded with human effluvia, ſeems ſo intimately connected with the peculiar malignity of this fever, the expediency of a free ventilation through the patient's chamber is obvious, and perhaps, if not of itſelf the moſt effectual curative meaſure that can be taken, is at leaſt that upon which the ſucceſs of all the others ſeems moſt to depend.

To thoſe whoſe circumſtances afford the comfort of a ſpacious well-aired bed-chamber,

ber, all the benefit that can flow from this measure, will be obtained by occasionally throwing open the doors and windows, and allowing the room to be refreshed by a current of fresh air.

When the chamber is small, if the weather is mild, and the patient can with tolerable conveniency be carried into the open fields or into a garden, and allowed to sit there a few hours, it ought to be done; for this practice has been found highly refreshing and cordial.

When from various circumstances this cannot be done, every means in our power to procure a free ventilation must be used, and the chamber should be frequently refreshed by sprinking it with vinegar.

Confining the patient constantly to his bed, under a load of bed-clothes, by which means his body is always surrounded by a kind of vapour-bath of his own effluvia, is exhausting and pernicious.

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The bed-clothes ought to be in no greater quantity than is agreeable to his own ſenſation; and when he can ſit up in an elbow-chair with his clothes looſely put on, it is often a refreſhing change of poſture and ſituation.

There are inſtances of patients in this fever, who while lying in bed thought their ſtrength ſo much exhauſted, that they could not poſſibly ſit in an erect poſture even for a few minutes; yet upon being carried on a couch into the open air, and remaining there for two or three hours, have been ſo much refreſhed, and have acquired ſuch an acceſſion of ſtrength or ſpirits, as not only to ſit up, but even to ſtand and walk a little.

In caſes where the patient can eaſily be moved into the open air, it is not impoſſible that the cheering verdure of the fields and rural objects, with the refreſhing ſmell of plants,

plants, at particular ſeaſons of the year, may contribute to the cordial effect which a free cool atmoſphere is found to produce.

Thoſe who have been long teazed and haraſſed for want of reſt, while confined under a load of bed-clothes, have obtained refreſhing ſlumbers after their bodies have been cooled by the reſtorative influence of the open air; and afterwards find their beds more comfortable, particularly when furniſhed with clean ſheets and cool freſh covers. With changes in this laſt article, thoſe who can afford it, ſhould frequently be furniſhed.

Whatever benefit is derived from the uſe of a ſtronger and more effectual ventilation in this fever than was formerly allowed; or from the open atmoſphere, when the patient can with ſafety and conveniency be carried into it, the honour is due to thoſe who firſt adviſed and introduced this judicious and ſucceſsful practice in the inoculation of the ſmall-

pox.

pox. After its ſalutary effects were manifeſt in the one diſeaſe, its application to the other was obvious; and indeed when we recollect that putrid fevers often originate in places where a perfectly free ventilation cannot be obtained, its application to this diſeaſe ſeems more natural than to the other.

As in the high inflammatory fever the ſymptoms ſeem to ariſe from the heart being ſtimulated to ſtronger exertions than are conſiſtent with health, and therefore we look for the cure in ſuch means as we know have a tendency to abate theſe violent exertions; ſo in this fever, whoſe ſtriking feature is debility, in which the nervous energy ſeems impaired, and the action of the heart is weaker than is conſiſtent with health, we look for the cure in ſuch means as give vigour to the vital powers.

Evacuants which diminiſh the quantity of the blood and humours, and refrigerants which are thought to abate their heat, are

therefore

therefore thought proper in the firſt caſe; cordials and ſtrengtheners in the ſecond.

It has been thought that bleeding may be neceſſary at the beginning of this diſeaſe, to prevent the fever from running too high, and producing inflammations of the brain, lungs, or other vital parts.

But all the obſervations I have been able to make, and the knowledge I have otherwiſe been able to acquire, convince me that we have much more certainty of the bad effects of blood-letting in this fever, than we have of the evils it prevents; part of this conviction I have received from the writings of two very eminent and very learned phyſicians, neither of whom ſeem themſelves however to have been ſo fully convinced of the bad effects of this evacuation.

Dr. Huxham, after deſcribing the caſe of a patient, with the ſtrongeſt ſymptoms of a putrid

putrid fever, adds, " He was bled to about " ℥xii. from his arm, *but this gave him no* " *manner of relief*; the oppreſſion, ſighing, " fainting, and anxiety continuing as bad " as ever, *nay rather increaſing*; a violent " hemorrhage alſo broke forth from his " noſe; which continuing from both noſ- " trils, he was bled again to ℥x. about " twelve hours after the former bleeding: " *Neither did this give him any relief, but* " *increaſed his weakneſs conſiderably*, and he " continued as anxious, reſtleſs, and op- " preſſed as ever, without even the leaſt " ſleep *."

The Doctor continues to relate the low ſtate to which his patient was reduced, and the dreadful ſymptoms which accompanied it; that he avoided giving him the hot, alexipharmic and volatile cordial medicines, which it was too much the practice of that time to adminiſter in ſuch caſes; that he

* Vide Huxham's Eſſay on Fevers, page 63 and 64.

alſo declined the application of bliſters, but that having experimentally and repeatedly known the great uſe of the bark, in preventing and ſtopping the advance of gangrenes, he ordered that medicine with elixir vitrioli; and by the continued uſe of theſe and ſome other reſtoratives the patient recovered.

The ingenuouſneſs diſplayed in the recital of this caſe, muſt ſtrike every body; few will be ſurpriſed that the two bleedings afforded ſo little relief, and many will be of opinion, that if the learned phyſician had treated his patient from the beginning as he did at the end, the diſeaſe would ſooner have come to a happy termination.

Indeed he ſeems afterwards to lean to this opinion himſelf; for in a ſubſequent part of his book he expreſſes himſelf in theſe words: "In truth bleeding in a con-" tagious diſeaſe, as ariſing merely from " contagion, ſeems not indicated; becauſe " the contagion is intimately mixed with

" the humours, and by drawing off a ſmall " part of the blood, you very little leſſen " the whole contagion, which will have its " effect whether you bleed or bleed not*."

The reaſon aſſigned for bleeding not being indicated, is unqueſtionably very ingenious; but the reaſon which makes the greateſt impreſſion upon my mind for not bleeding in this fever, is ſimply becauſe it ſeems generally to do harm.

Thoſe who ſtill are of opinion that bleeding is neceſſary in this fever, confine it to thoſe caſes in which the pulſe is ſtrong and full. It has been already obſerved, that the pulſe is generally not ſtrong and full in this diſeaſe; and when the pulſe is in this ſtate we are apt to imagine, that a diſeaſe of a different nature is impending; this, to be ſure, may ſerve as an apology for the evacuation, which, if we had been certain of

* Vide Huxham's Eſſay on Fevers, page 102.

the nature of the fever, the fulneſs of the pulſe, in my opinion, would not have done.

The other work above alluded to, which helped to give me an early impreſſion of the inexpediency of bleeding in this fever, is the Obſervations on the Jail or Hoſpital Fever, by the late Sir John Pringle:—This learned gentleman's words are, "But in "the ſecond ſtate, when the fever was "manifeſt, if the pulſe was full, I generally "took away ſome blood, if that had not "been done before. When the ſymptoms "run high, a plentiful evacuation of that "kind ſeemed indicated; *yet I obſerved that* "*large bleedings generally did harm, by ſink-* "*ing the pulſe and affecting the head.* Nor "was a moderate bleeding to be repeated "without caution; for as ſeveral circum- "ſtances here were different from thoſe of "common fevers, ſo experience ſhewed, "that even thoſe whoſe blood was ſizy,

" unleſs their lungs were inflamed, were " the worſe for a ſecond bleeding *."

Certainly there can be few ſtronger reaſons for bleeding than an inflammation in the lungs; but I imagine this is not a common ſymptom in the malignant fever.

The ſame learned gentleman afterwards ſays, " But what is *obſervable*, if the patient " had been once or twice largely bled, on " the firſt ſymptoms, he would ſometimes " paſs over the ſecond ſtage, and from a " condition little removed from health, his " pulſe would be apt to ſink, and he ſud- " denly become delirious. Now, whether " this change was occaſioned by miſcon- " duct, or came in the courſe of the diſ- " eaſe, I found it neceſſary to vary my " method, and to have for my principal " intention, the ſupport of the vis vitæ †."

* Vide Sir John Pringle's Obſervations on the Diſeaſes of the Army, pages 306 and 307.

† The ſame, page 311.

I did

I did think the above remark ſo very *obſervable*, that I became more and more cautious of bleeding in this fever, being confirmed in a more ſucceſsful practice by what this diligent and attentive phyſician continues to relate, concerning the accident by which he was induced to give the bark to a man ill of this fever with petechial ſpots. The bark, he candidly owns, was not given on account of thoſe or any other ſymptom of the fever, but becauſe a mortification threatened the patient's back after a bliſter. The uſe of this medicine not only ſtopped the progreſs of the mortification on the man's back, but gave a favourable turn to the fever; which happy effect did not eſcape Sir John Pringle's attention, but led him to give the bark in many other caſes, the good effect of which he enumerates.

It has been obſerved that this fever is moſt apt to begin with inflammatory ſymptoms, in ſuch patients as are much expoſed

to cold and moiſture; and that in camps particularly, ſymptoms of that complexion are more apt to appear when the diſeaſe is epidemic, than in cities, which is imputed to ſoldiers having fewer conveniencies, and being leſs guarded againſt the influence of cold, than the loweſt claſs of the inhabitants of towns.

Dr. Donald Monro, in his Account of the Diſeaſes of the Military Hoſpitals, obſerves, "That this malignant fever began variouſly "in different ſubjects; for the moſt part "with cold and ſhivering, pain in the head, "and other ſymptoms commonly deſcribed "as peculiar to this fever. In ſome, it be- "gan with a *ſharp pain of the ſide*, or other "parts, attended with *acute inflammatory* "*ſymptoms*, &c." A little below he makes the following judicious reflection: "The "reaſon of this difference of ſymptoms in "the beginning, and of theſe different ap- "pearances of the blood, ſeemed to be, that "ſuch patients as laboured under pleuriſies,

"low

" low or other fevers, being brought into " hoſpitals, where the malignant fever was " frequent, had their original diſorders " changed into this fever by breathing a " foul infected air, and by their commu- " nication with thoſe ill of the fever and of " fluxes*."

Upon the whole, I imagine it may be laid down as a rule admitting of very few, if any exceptions, that bleeding is highly improper when we are certain that the diſeaſe is the true nervous malignant fever; for ſince we find that this fever can change the nature of highly inflammatory diſeaſes, and convert them into its own, to venture upon this evacuation in caſes where no local inflammatory complaint is ſuperadded, muſt do ſtill more harm by hurrying on the ſymptoms of debility, by much the moſt dangerous of the diſeaſe.

* Vide Dr. Monro's Account of Diſeaſes in the Military Hoſpitals, &c. pages 7 and 8.

To free the alimentary canal of all impurities, is equally expedient in this as in other fevers, and the ſooner it is done the better; on the very firſt appearance, therefore, of uneaſineſs in the head, liſtleſſneſs, or alternate heats and colds, five or ſix grains of emetic tartar may be diſſolved in a quart of warm water, or of camomile infuſion, of which the patient may drink half a pint every quarter of an hour till it excites vomiting, which ought to be aſſiſted as uſual by drinking freely of warm water.—The emetic generally relieves that oppreſſion about the precordia which ſo commonly attends this diſeaſe.

If this medicine ſhould, ſome hours after operating as an emetic, alſo act effectually as a purgative, which is often the caſe, no other purgative will be neceſſary.

But if it only proves emetic, the contents of the inteſtines ſhould be entirely evacuated the following day by a proper cathartic medicine.

The

The evacuation by a cathartic undoubtedly weakens in ſome degree, as well as that by veneſection; but this is more than compenſated by the benefit reſulting from cleanſing the bowels of their impure contents; whereas veneſection, without producing any certain benefit, is apt to occaſion greater debility, and of a nature not ſo eaſily to be remedied.

Beſides, a cathartic exhibited in proper time often prevents the bad effects of too ſevere purging, by carrying off the ſource of an impending diarrhœa, which might ſoon take place in conſequence of bilious matter and other impurities being pent up in the bowels.

And in caſe a diarrhœa has actually come on before we ſee the patient, the firſt thing to be done is to give a purgative, whoſe operation ſhould be aſſiſted by drinking plentifully of imperial, or of water gruel, or barley-

barley-water, with ſome cream of tartar diſſolved in them; and if the patient ſeems much fatigued and exhauſted by the preceding looſeneſs and the operation of the purgative, eight or ten drops of Thebaic tincture may be given in a ſpoonful of ſimple cinnamon water.

It was obſerved before, and ought to be kept conſtantly in remembrance, that the danger of this fever is in proportion to the debility. If it be doubtful whether in the common remitting fever it is always prudent to delay giving the bark, and to confine our treatment to antimonial alteratives, ſaline mixtures, and neutral ſalts, in expectation of a more complete remiſſion; it may eaſily be conceived how much more improper it would be to delay that powerful medicine in this inſidious diſtemper, where the force of the circulation ſeems impaired from the beginning, and the moſt

dangerous

dangerous proſtration of ſtrength is apt to come ſoon after the firſt perception of any ailment.

When a malignant fever happens to be epidemic, the ſlighteſt appearance of complaint ſhould give an alarm, and forms a good reaſon for ordering an emetic and purgative; if to the headach is joined dejection of ſpirits, ſlight chills and heats, and the ſmalleſt tendency to tremor in the hands, the alarm ſhould be taken independent of any reigning epidemic, and in both caſes the bark ſhould be given immediately after thoſe evacuations.—What, while the ſkin is dry? When there is little or no perſpiration? During the ſpaſm? Yes, during any thing.

Theoretical opinions muſt in ſuch an emergency have no weight: A dangerous debility, and a train of malignant ſymptoms are threatened; the bark is found the moſt powerful

powerful means of preventing theſe; and notwithſtanding its aſtringent quality, frequently promotes a ſalutary diaphoreſis more effectually than any of the medicines which enjoy from preſcription the title of diaphoretics. When the patient is out of danger you may account for this in the beſt manner you can, and ſettle the point at leiſure, whether in producing theſe effects it has acted in the character of a tonic, a diaphoretic, or an antiſeptic.

In the circumſtances that have been deſcribed, the nature of the diſeaſe being aſcertained, and the alimentary canal intirely cleanſed, the bark ſhould be given without waiting for very diſtinct remiſſions. To wait for ſuch when the diſeaſe appears from the beginning to be the nervous malignant fever, is to wait for what will not happen; depriving the patient of a probable chance of the fever being carried off at once, and allowing him to incur a riſk which might have

have been prevented, of ſinking ſuddenly into ſuch a ſtate of weakneſs and inſenſibility, as will render the bark and all other medicines of no avail.

Having reſolved then on giving the bark, our next care ſhould be to avoid the very common error of underdoſing it. One ounce or an ounce and a half of this medicine may be given to an adult in the ſpace of twenty-four hours; or if it is diſagreeable to the patient in ſubſtance, what is equivalent to this quantity may be given in decoction; ſome patients can take the powder in the decoction as eaſily as in any other vehicle. A much larger quantity has been recommended by ſome authors in the ſame ſpace of time, but there are very few patients whoſe ſtomachs can bear a greater quantity, and many who cannot take ſo much. The expediency of increaſing or diminiſhing the doſes muſt depend upon circumſtances. Whether this medicine be given

given in ſubſtance or in decoction, the addition of a few drops of elixir of vitriol is often found to render it lighter and more agreeable, perhaps, in ſome caſes, more effectual.

If the pulſe is particularly ſmall, and the patient complains of great weakneſs, a little wine may be given occaſionally even at this period of the fever; it may be added to panado or water-gruel, if the patient can take any ſuch nouriſhment; or a little may be mixed with each doſe of bark, which ſometimes is found to remain eaſier on the ſtomach by this addition. But the propriety of giving or continuing wine at this period, depends on the ſtrength of the pulſe and the effect of the cordial.

It is not improbable that the bark itſelf, exhibited in this manner, will prove opening in ſuch a degree as to ſuperſede the uſe of any other means for that purpoſe; but if the

the body continues bound, it will be expedient to procure one motion daily by clyſters. If on the contrary, the bark excites a purging, this effect may be reſtrained by giving two or three drops of laudanum in each doſe, or every ſecond doſe of bark.

After the medicine has been continued in this manner for two or three days, we often have the ſatisfaction to find the fever intirely thrown off, or abated in a conſiderable degree. In either caſe it will be proper to continue the uſe of the bark, but in a much ſmaller quantity, for two or three days more, at the end of which the fever is generally gone, and the pulſe ſlower than before it began.

It ſometimes happens in this fever, that a quick and weak pulſe is accompanied with difficult reſpiration and confuſion in the head, and that both ſymptoms proceed principally

principally from debility; in ſuch caſes the bark renders the pulſe fuller and ſtronger, and in proportion as it becomes fuller, it becomes alſo ſlower; the oppreſſive breathing abates, the threatened delirium is removed, the ſkin, which was before dry, is perceived to be moiſt, with a warm and gentle perſpiration, and a ſediment is ſoon after perceived in the urine.

But if after a fair trial for two or three days, the diſeaſe ſeems to have repelled the powers of the medicine, ſtill there is no harm done, the fever will run its courſe, but the patient has as good, perhaps a better chance of recovering at laſt, than if the trial had not been made; for although the bark has not been able to prevent the progreſs of the fever, it may tend to obviate or leſſen in ſome degree that exceſſive proſtration of ſtrength which is its moſt alarming ſymptom. It is difficult, if not impoſſible to prove, that what does not happen, or happens

happens only in a certain degree, would have happened in a greater degree if a different method had been followed. Yet in certain cafes where the bark has failed in throwing off the fever, it feemed to me that the medicine had ftill contributed to fupport the patient's ftrength, and to prevent the exceffive debility.

When however this powerful febrifuge fails in the principal object of ftopping the progrefs of the fever, and when the patient perhaps naufeates any farther ufe of the medicine, our next care muft be to fupport his ftrength by light nourifhment and more agreeable cordials, during the continuation of the difeafe; taking care at the fame time by laxative clyfters feafonably adminiftered, to obviate that tenfion and fwelling of the belly, difficulty of making water, and other inconveniencies, which are the confequence of conftipation; and if clyfters are not found effectual in preventing or removing

theſe, a gentle doſe of rhubarb, or ſome other mild purgative, muſt be occaſionally given, which in this ſituation will prove, in effect, a reſtorative and not a weakener, by throwing out of the body the ſource of many teaſing and exhauſting ſymptoms: A few grains of James's powder, given twice or thrice in twenty-four hours, often proves the moſt beneficial laxative that can be given.

Although the fever has eluded the firſt attempt of removing it by the bark; and although the patient, diſguſted with the quantity he has ſwallowed during the trial, has refuſed to take any more, yet if afterwards in the courſe of the diſeaſe, this diſguſt wears off, and the patient can be perſuaded to take two or three doſes in the twenty-four hours; even this ſmall quantity has often ſeemed to me to ſupport the patient againſt that dangerous debility, which ſeems ever impending in this fever.

The

The reputation of the bark is independent of theoretical opinions. Thoſe who believe in a putreſcency of the blood and humours give it as an antiſeptic; thoſe who believe in no ſuch matter, give it as a tonic: For my own part, I recommend it as a medicine that does good, without pretending to know, and being little ſolicitous about the particular character in which it acts.

It is not uncommon in the practice of medicine, for phyſicians to follow the ſame plan on different, or perhaps oppoſite principles. Thus one may recommend ripe fruit, vegetable juices, and acidulated drinks in this fever, with a view to correct the putrid tendency of the humours; another who knows it is impoſſible for theſe fruits and drinks to correct what he thinks does not exiſt, may ſtill preſcribe them with a view to their deterging the excretory veſſels, by their ſudorific and diuretic qualities; and

each may be confirmed in his ſuppoſition by the benefit the patient receives from the preſcription. Some people may doubt either ſuppoſition, but nobody can doubt the agreeable and refreſhing effects of ſuch fruits and juices on the parched, thirſty, and languid patient.

Sometimes ripe fruits, particularly ſtrawberries and wine, are the only nouriſhment he will take; which circumſtance of itſelf forms a preſumption, that they are the propereſt for him. At other times, when he refuſes panado, ſago, rice, when prepared without wine, he will take them in conſiderable quantity mixed with wine and ſugar; and when he takes ſuch nouriſhment with any degree of reliſh, they ſeldom fail of being beneficial. They enable him to bear the open air and a free ventilation for a longer time, which always tends to haſten his recovery.

When

When that proſtration of ſtrength, ſo often mentioned, has taken place, and is followed by ſtupor, low delirium, twitching of the tendons, and other ſymptoms; however proper we may think the bark would be, and however eager we are to give it, this is no longer in our power. In this ſtate the patient generally rejects it in all its forms, or will only take it in ſuch ſmall quantity as can be of no ſervice. Yet the caſe is not entirely hopeleſs; for even in this ſituation, if the lips are moiſtened with a little warm wine, ſweetened with ſugar, he will ſhew a reliſh for it, and when given in ſpoonfuls, will ſuck it into his mouth, with ſigns of ſatisfaction, after rejecting every medicine with diſguſt, and refuſing every other kind of nouriſhment whatever.

In one particular caſe of this nature, which I well remember, after a certain quantity of wine (perhaps near a pint) had been given in the ſpace of an hour, I perceived the patient's pulſe acquire ſtrength

and become ſlower, while the inſenſibility ſeemed to wear gradually away; but the relations taking an alarm at this quantity of wine, notwithſtanding thoſe flattering appearances, withheld it, and offered the patient ſome other drink, which in their opinion was more ſuitable to his caſe. Notwithſtanding his again and again rejecting every thing they offered, it was not till after they plainly perceived the pulſe begin to ſink, and the delirium to return, that they could be prevailed on to give more wine, which, upon my returning to viſit the patient, I perſuaded them to do, and with the ſame ſucceſs as before.

I have known inſtances alſo where the phyſician not being convinced that the filling of the pulſe and removal of delirium was owing to the wine, has ſet aſide the uſe of it in the ſame manner, till the return of the bad ſymptoms obliged him to reſume it, not without remorſe for having made an

experiment which had like to have proved fatal to the patient.

It is generally neceſſary, in ſuch caſes, to begin by giving the wine warm with ſugar, to induce the patient to take three or four ſpoonfuls, but afterwards he takes it freely cold, and without ſugar.

The reader might be aſtoniſhed were I to mention the quantity of wine I have known ſome patients take in this fever, and in ſome caſes of the confluent ſmall-pox, where the weakneſs, inſenſibility, and other ſymptoms were the ſame, and where the recovery of the patient was evidently owing to that cordial alone. The proper rule is to give the wine till the pulſe fills, the delirium abates, and a greater degree of warmth returns to the extremities. Upon the ſmalleſt appearance of the ſtupor coming back, the pulſe quickening and ſinking, for they all go together, the wine muſt be reſumed.

Attentively obſerving this rule, I have often known patients, who in health were not fond of wine, and who would have been intoxicated with a ſingle bottle, drink in the ſpace of twenty-four hours two bottles of claret without any other effect but that of ſtrengthening the pulſe, abating the delirium, removing the tremor, and creating a moderate warmth on the ſkin. In others I have known a much greater quantity neceſſary to produce the ſame effect; but by giving that greater quantity the ſame effect was produced. As I am told that this part of my work (and perhaps many others) will be expoſed to cenſure, I refrain from mentioning the exact quantity of wine which I have known ſome particular patients take, with the beſt effects, in this fever—it is ſufficient to ſay that it ought to be given in ſuch quantity as the patient will willingly take, till the effects above mentioned are produced, and then ſtop; but on the firſt

appearance of the pulſe becoming weaker, or any other ſymptoms returning, more wine muſt then be given, perſevering in that quantity which is found by attentive obſervation ſufficient to keep up the pulſe and ward off the other bad ſymptoms.

When that quantity has been continued for ſeveral days, it may be gradually diminiſhed; a little bread ſoaked in the wine, or ſome other ſimple nouriſhment may be offered. After the patient is able to take panado mixed with wine, or bread ſoaked in it, with any degree of reliſh, the appetite ſometimes becomes very keen, and he is even willing to take more panado, rice, or ſago mixed with wine than is proper for him.

This return of appetite is undoubtedly one of the ſtrongeſt indications of returning health; but it muſt be indulged with caution; the patient muſt be allowed to eat but little at a time, even of this kind of nouriſh-

nouriſhment, and to return very gradually to his uſual food.

Soon after the fever is entirely removed, and long before the patient has recovered his ſtrength, he will, by proper management, be intirely weaned from the wine, or his allowance may be reduced to two or three glaſſes in a day, if the phyſician ſhould think that quantity more proper than none. Indeed, the third part of what formerly had proved a ſalutary cordial and a reſtorative, would, in this ſtate of convaleſcence, occaſion a dangerous intoxication. So great a difference is there in the effect of this cordial upon the conſtitution, in this ſtate of extreme weakneſs, when all the natural functions ſeem loaded and clogged by diſeaſe, from what it has in perfect health, or when the fever being juſt removed, the animal functions gradually reſume their former courſe.

Claret

Claret is the wine I have generally recommended, when the circumſtances of the patient could afford it. I have ſeen the ſame good effects, however, from the uſe of Port, Madeira, and other wines; and when no kind of wine is to be had, brandy or rum diluted with water or milk, and ſweetened with ſugar, muſt be ſubſtituted in its place. In the ſtate of ſtupor, debility, and low delirium, already deſcribed, ſpirits diluted have nearly the ſame effect with wine, and are even more reliſhed by a certain claſs of patients.

In what is called the putrid ſore throat, and in caſes where the ſymptoms of weakneſs, always conſiderable in that diſeaſe, are greater than uſual, the bark ſometimes will not remain upon the ſtomach, unleſs it is given in wine; and when ſo given its beneficial effects ſeem moſt apparent; and in many caſes of that diſeaſe which I have met with, where this reaſon for giving wine did not exiſt, and the bark was taken in very

very conſiderable quantity alone, the effect of filling the pulſe and removing the alarming debility did not appear to me ſo evident and certain as when the medicine was given in wine; even a *ſmaller* quantity of bark, with the addition of wine, ſeemed to have a more immediate and more conſiderable effect than a much larger quantity without wine.

The cynanche maligna, a diſeaſe analogous in ſome eſſential circumſtances to this fever, was frequently epidemic in that part of the country where I formerly lived. Wherever the ſymptom of debility was conſiderable, my conſtant practice was to give the bark from the beginning in Port wine to adults, and in wine and water to children, and always with good effect; the whole of the treatment conſiſted in this and the frequent uſe of gargles. In the villages around, where great numbers were generally ill of the diſorder at the ſame time, and where ſpirits diluted were preferred to wine, the ſame good conſe-

quences

quences attended their uſe; very few patients were loſt, except in caſes where this practice was not obſerved.

I have ſeen the weakneſs ſo great in this diſeaſe, that the patient could not ſit up in his bed, that his throat might be accurately examined, without danger of fainting; yet after a few doſes of bark mixed with Port wine or Madeira, his pulſe became ſtronger and fuller, and he raiſed himſelf with little aſſiſtance, and ſat up firmly; but in other patients, in nearly the ſame ſituation, double the quantity of bark taken in any of the ſimple waters, hardly produced the ſame effect, and never ſo ſoon: And where wine was not to be got, or could not be afforded, rum or brandy diluted ſeemed in all reſpects equivalent. However pernicious the habitual and immoderate uſe of wine or other ſpirituous liquors may be in perfect health, yet when the energy of the brain and nerves is ſo much diminiſhed, and the vital powers

of

of the muſcles ſo benumbed by certain diſeaſes that the ſpark of life ſeems almoſt extinguiſhed, thoſe cordials are then abſolutely neceſſary to keep it alive, and give time to the bark or Nature to overcome the diſeaſe and reſtore health and vigour.

It may ſeem extraordinary that I make no mention of Virginian ſnake-root, contrayerva root, the volatile ſalts, camphor, muſk, and other medicines that are uſed in the low ſtate of the nervous fever;—all I have to ſay on that head is, that I have tried each of their powers ſingly, and compared them with thoſe of Peruvian bark and wine, with all the attention I am capable of beſtowing; the effect of which has been the ſtrongeſt conviction on my mind that none of them, nor any combination of them, are equal in efficacy to the bark and wine. An exception perhaps might be made in favour of muſk, which when given in the quantity of at leaſt a drachm in the courſe

courſe of a day, has a peculiar power of abating and removing the ſymptoms of ſubſultus tendinum and hiccup; but even this effect is rendered more certain by giving wine at the ſame time; and beſides, whatever may be the powers of muſk as an antiſpaſmodic or diaphoretic, thoſe of wine are infinitely greater as a cordial and reſtorative *.

When

* In the fourth volume of the Medical Obſervations and Inquiries, there is a very accurate account of an epidemic diſtemper, by Dr. Sandeford of Barbadoes, which he denominates a putrid remitting fever. Although I may not perfectly agree with that gentleman in ſome of the theoretical opinions he ſeems to have adopted, yet I find my own obſervations reſpecting the little efficacy of the other medicines uſually given in this fever ſo ſtrongly confirmed by what he obſerved in their uſe on that occaſion, and alſo the powerful effects of the bark, that I am tempted to extract the following paſſage:

"Having now cleanſed the firſt paſſages, the next indi-
"cation to be fulfilled, appeared to be that of checking
"and correcting the putreſcent ſtate of the juices, and of
"co-operating with Nature in eliminating the morbid
"matter through the proper excretories; for which pur-
"poſe the warm, cordial, alexipharmic, and antiſeptic
"medicines ſeemed principally neceſſary; but though
"theſe had all the good effects that could be expected from
"them,

When a diarrhœa ſupervenes in ſuch a degree as the patient cannot bear in his preſent low and weakened ſtate, Sir John Pringle recommends ſome ſpoonfuls of chalk

" them, in keeping up the vis vitæ, correcting the hu-
" mours, and aſſiſting Nature in the expulſion of the
" morbific matter, *yet all theſe proved inſufficient of them-*
" *ſelves to effect a cure*, until the uſe of the bark was in-
" troduced, the patient often diſſolving away under the
" violent profuſe cold ſweats, until this medicine put an
" effectual check to them; nay, ſo ſingular was the effi-
" cacy of this medicine in this diſeaſe, that I can truly
" ſay, I know *of none that were cured without it; and all*
" *thoſe who neglected to take it, however conformable they*
" *might have been in other reſpects, were nevertheleſs often*
" *precipitated into the danger of a dropſy or conſumption:*
" Of ſuch indiſpenſable uſe was the bark in this diſeaſe!

" In my firſt uſe of this medicine, I blended it with the
" alexipharmics, in the form of a decoction; but as all
" the good effects reſulting from the mixture *ſeemed prin-*
" *cipally owing to the bark* contained in it, I thought it
" was but juſt to give it its due preference; and accord-
" ingly afterwards adminiſtered it alone, either in decoction
" or ſubſtance, as it ſeemed neceſſary.

" It is proper to remark particularly, that whereas moſt
" writers forbid the uſe of the bark abſolutely, unleſs in the
" ſtate of remiſſion and intermiſſion, I found it neceſſary
" to give it at any time of the diſeaſe indiſcriminately;
" and ſucceſs juſtified the practice, the patient otherwiſe
" diſſolving away irretrievably under the cold colliquative
" ſweats he had perpetually upon him."

There

chalk julep with opium, to be given after every looſe ſtool. But it often happens that the patient will not take that medicine; in ſuch caſes, a few drops of the tinctura Thebaica in a little warm wine, mulled with cinnamon and ſugar, will have the ſame effect. Wine thus prepared is highly agreeable to the patient's taſte, and if the diarrhœa continues obſtinate, to the few drops of Thebaic tincture given after each looſe ſtool, may be added a proportional quantity of tincture of ipecacuanha to render each doſe of the nature of Dover's powder, and may be taken in mulled wine without being perceived by the patient.

There perhaps cannot be a ſtronger inſtance of the influence that preconceived opinions have even upon enlightened minds, than what may be obſerved from the above extract. This gentleman being perfectly perſuaded that the blood and juices were in a putrid ſtate and that antiſeptics of courſe were the antidotes, and that a morbific matter was to be expelled, thought he ſaw all this performed by medicines, which however he himſelf declares in no one inſtance ſtopped the diſeaſe, but which allowed the patient to diſſolve away.

This addition renders the opiate more effectual in reſtraining the diarrhœa, and at the ſame time increaſes its diaphoretic quality.

Bliſters, although pretty generally condemned at the beginning of this fever, are recommended by many authors in the advanced ſtate, and particularly in the caſe of ſtupor and low delirium. Thoſe who recommend them, however, as happens almoſt conſtantly in medical matters, are of different opinions reſpecting their manner of acting. Thoſe of the old ſchool, who retain the idea of a morbific lentor in fevers, think the cantharides are abſorbed and help to diſſolve it; others impute their good effects to the evacuation of ſerum, which, in their opinion, tends to produce a relaxation of the ſpaſm of the extreme veſſels; ſome think they act by occaſioning revulſion; and a fourth claſs imagine they are of ſervice only as ſtimulants.

I ſhould

I ſhould have been happy to have found them of ſervice, although the particular character in which they act had remained a ſecret; but notwithſtanding my having watched their effects with all the attention I am capable of, and formerly with a ſtrong prepoſſeſſion in their favour, I cannot aſſert that I ever knew veſicatories of much uſe in any ſtage of this diſeaſe; but I have frequently ſeen the patient teaſed by their irritating quality, without their ſeeming to have any other effect; and ſometimes I have imagined they produced that diſtreſſing ſymptom deſcribed in pages 475 and 476.

The duration of this fever is uncertain; it may be thrown entirely off by the earlieſt evacuations and the antimonials; or having ſtood them, its courſe may be abridged by the bark; or, baffling the efficacy of all medicines, it may continue its progreſs to the end of the ſecond week, and remain after what is called the low ſtate has taken

place, with no very conſiderable variation, for a week longer, and in ſome inſtances for two. When the diſeaſe is prolonged in this manner, it has been already ſaid, that our principal object ſhould be to prevent the patient from ſinking; an object which will be more certainly, though leſs ſcientifically accompliſhed by the ſeaſonable adminiſtration of light palatable nouriſhment and wine, than by all the preſcriptions with which the apothecary's file is too frequently loaded on ſuch occaſions.

I have declined mentioning many remedies that have been ſtrongly recommended for particular ſymptoms, being convinced, on what appears to me the beſt ground, that they have been cried up far above their deſert, and that the moſt efficacious of them are inferior to the means recommended above.

There are complaints wherein it may be neceſſary to order medicines, merely for the purpoſe

purpoſe of amuſing the imagination, and ſatisfying the prejudices of patients; ſome of whom cannot conceive that a diſeaſe is to be cured without drugs, and ſeem to think it will be the ſooner cured the faſter they are ſwallowed; but in the preſent ſituation the patient has no prejudices, but he ſtill has a diſtinction of taſte; and if he is teized to ſwallow what he deteſts, it will put him from taking that cordial nouriſhment which is neceſſary for his ſupport.

In very malignant caſes this fever ends fatally on or before the ſeventh day, but more frequently thoſe who die are carried off about the middle or towards the end of the ſecond week. When the patient ſurvives the twentieth day, it rarely happens that he does not finally recover: When the fever terminates favourably before or at the end of the ſecond week, the criſis is generally obvious; but when that happens at a later period, particularly if after the third week,

the favourable turn is leſs evident, and ſometimes ſeveral days paſs, during which the diſeaſe abates ſo gradually, that the moſt experienced are in doubt whether it abates or not: At length, however, it becomes evident by a warm moiſture being perceptible on the ſkin, by the dark-coloured gluey ſubſtance which adheres to the gums and lips, growing leſs tenacious, and being more eaſily removed; by the ſtools regaining a natural colour; by the urine being made in greater quantity, and depoſiting a ſediment; by a return of appetite, and by the pulſe becoming ſlower than it was before the commencement of the diſeaſe.

When the fever has been of long duration, ſuppurations of the lymphatic glands of the neck or armpit ſometimes take place at the decline. All that is neceſſary to be done in ſuch caſes, is to encourage the ſuppuration by the application of poultices. They generally heal without difficulty after

after breaking, or being opened by the ſurgeon.

Although no ſuch ſuppurations ſhould take place, when this fever is of an uncommonly malignant nature, it always leaves a great degree of weakneſs behind it; and there are inſtances of this imbecility not being confined to the body.

Many patients, particularly thoſe advanced in life, are ſubject during their convaleſcency to ſwellings of the feet and ancles; a ſymptom which for the moſt part diſappears gradually as the ſtrength returns; but in caſe it is more obſtinate, or increaſes and ſeems to threaten an anaſarca*, it will be proper to give fifteen or twenty grains of the powder of jalap rubbed with an equal quantity of nitre or ſome purgative of the ſame nature, once a week; and ſome

* A particular ſpecies of dropſy.

gently

gently diuretic medicine in the intervening days. Promoting the ſecretion of urine is found peculiarly uſeful for the removal of this ſymptom and its conſequences. I have found nothing anſwer that intention better than pills formed of freſh ſquills and nitre, with a ſmall proportion of ſpecies aromaticæ. While this ſwelling of the ancles continues, and of courſe an increaſe of the diſcharge by urine is to be wiſhed, Rheniſh is preferable to any other wine.

In all caſes where the fever is unuſually protracted, and leaves the patient in exceſſive weakneſs, the recovery is ſlow and precarious, and the greateſt care is required to prevent any error in regimen during the convaleſcence, a very ſmall degree of exceſs being then moſt apt to produce very troubleſome conſequences.

Food of eaſy digeſtion, taken in ſmall quantity and repeated frequently, gentle exerciſe

exercise in a carriage when the weather is favourable, attention to prevent costiveness by some mild laxative, and the use of some light agreeable bitter, to assist digestion and prevent flatulencies, are the most approved means of promoting the return of the patient's strength.

I have now given the clearest and most intelligible idea which my reading, experience, and reflexion, such as they are, enable me to form of the nature of fevers, with what appears to me the best method of treating them; happy if I have been able to add a small ray to the stronger lights thrown on this important subject by men of far brighter abilities.

THE END.

ERRATA.

Page 160, line 8, *for* quanity, *read* quantity.
177, — 4, *Note*, *for* of a courſe, *read* of courſe.
206, — 11, *before* the perſon *inſert* and.
286, — *ult*. *read* can produce fever.

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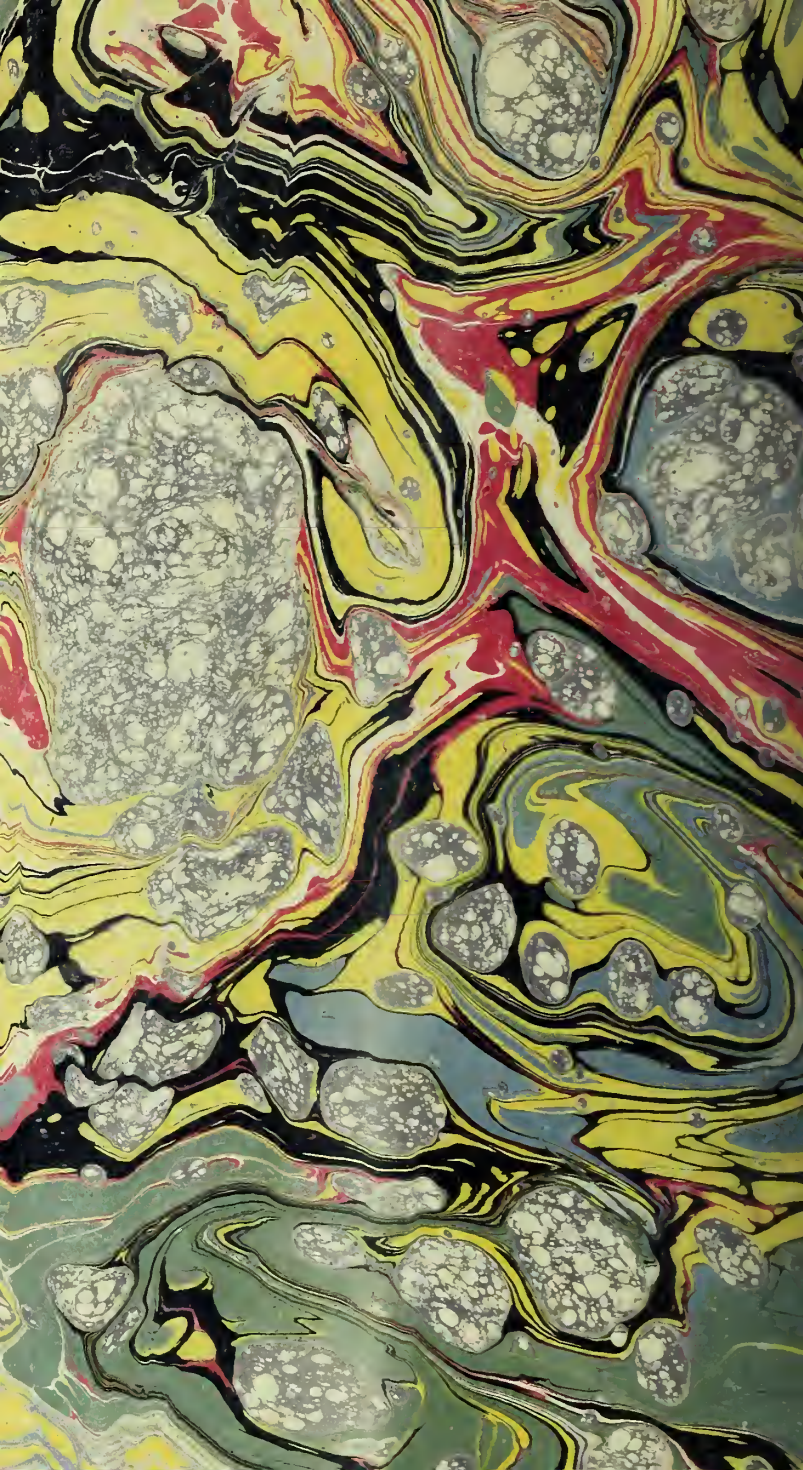

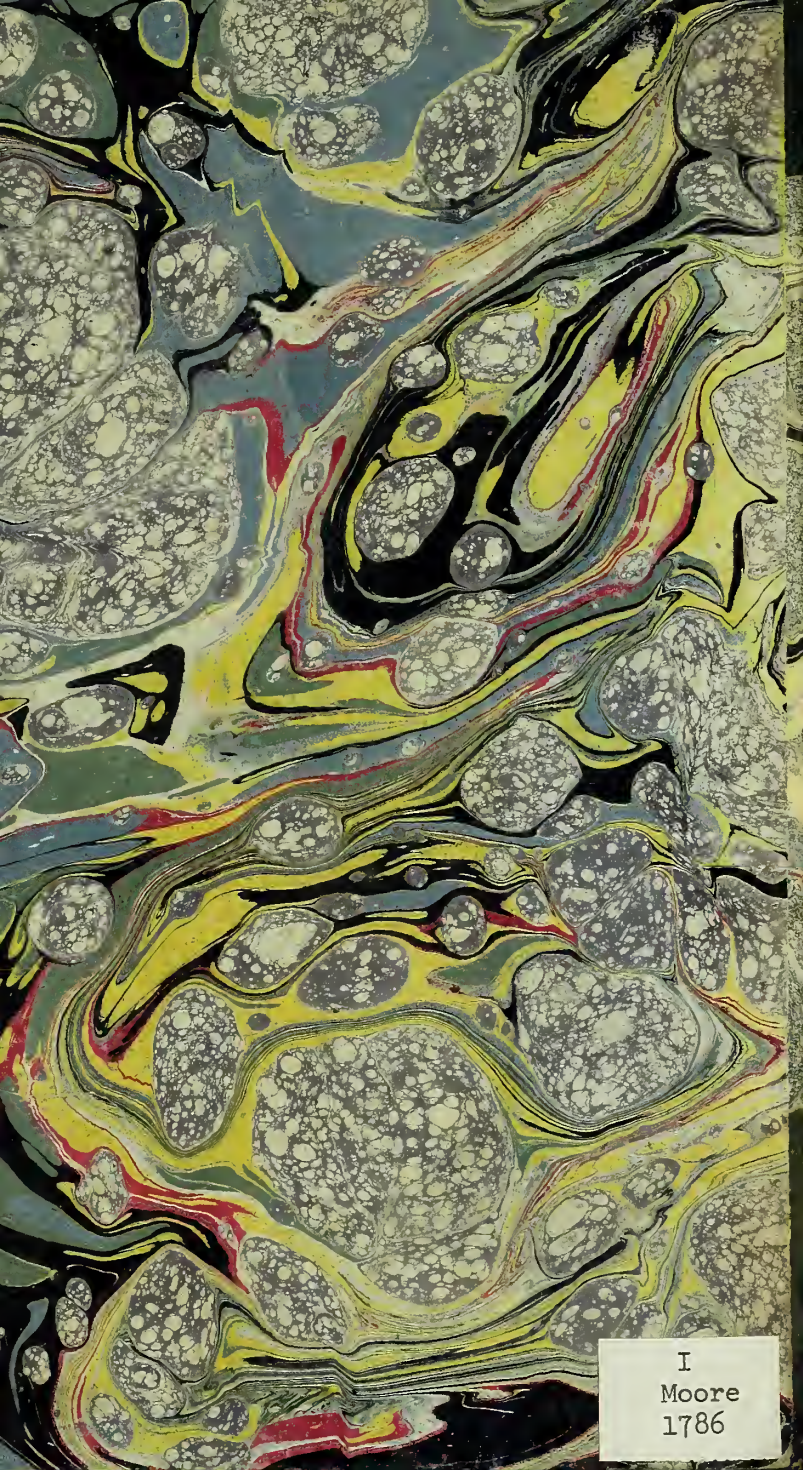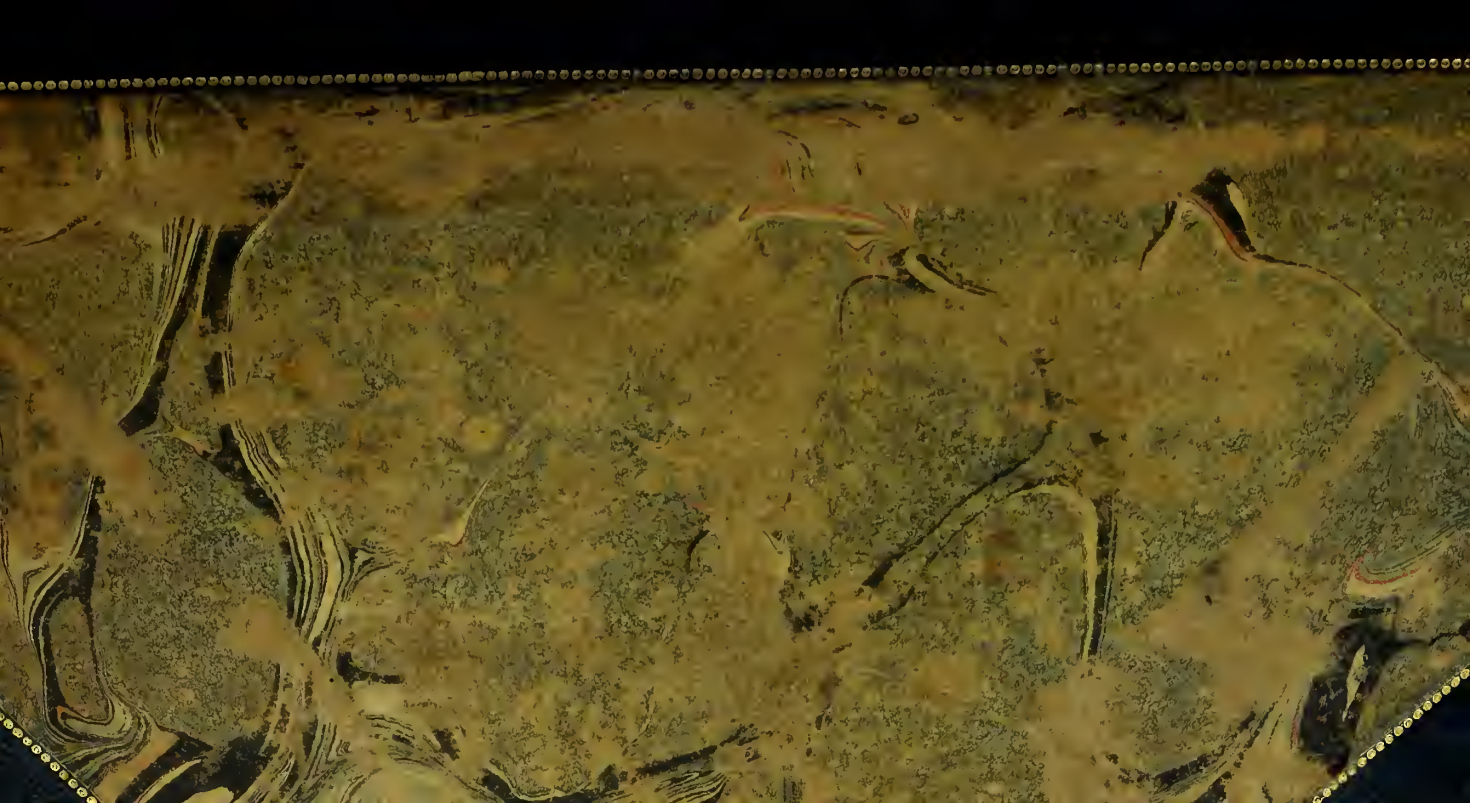
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